FIRST METHODOLOGY ELEMENT ASSESSMENT REPORT FOR AXIOS MOBILE ASSETS

Document Prepared by First Environment, Inc.

Methodology Element Title	Transport Energy Efficiency from Lightweight Pallets	
Version	1.6	
Methodology Element Category	Methodology	√
	Methodology Revision	
	Module	
	Tool	
Sectoral Scope(s)	03 – Energy Demand; 07 – Transport	

Report Title	First Methodology Element Assessment Report for Axios
Report Version	2
Assessment Criteria	• VCS Standard: VCS Version 3, 1 February 2012, v3.2 • VCS Methodology Approval Process, 1 February 2012, Version 3.3
Client	Axios
Pages	12
Date of Issue	10 October 2012
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Summary:

First Environment, Inc. (First Environment) was retained to provide the first assessment in the VCS double-approval process for the proposed Methodology Element titled, "Transport Energy Efficiency from Lightweight Pallets." The Methodology Element provides procedures for monitoring and calculating emission reductions associated with the use of lightweight pallets to transport goods.

The proposed Methodology Element belongs to sectoral scopes 03 (energy demand) and 07 (transport).

The methodology assessment process consists of an independent third-party review of the new Methodology Element. In particular, the methodology assessment shall confirm that the Methodology Element is consistent with relevant VCS rules and procedures. The assessment of the new Methodology Element is done through a double-approval process, according to the VCS Standard, and is necessary to provide assurance to stakeholders of the quality of the new Methodology Element.

The methodology assessment was conducted using the VCS Standard, v3.2 and the VCS Methodology Approval Process, Version 3.3 as the criteria. Additionally, First Environment followed guidance in the VCS Program Guide, Version 3.2 and applied its professional judgment as informed by ISO 14064-2 and 14064-3 in assessing the proposed methodology.

During the methodology assessment process, First Environment issued several clarification and corrective action requests – all of which were addressed sufficiently by Axios. First Environment is of the opinion that the "Transport Energy Efficiency from Lightweight Pallets," as described in the Methodology Element Version 1.6 dated April 23, 2012, meets all relevant VCS requirements for VCS Methodology Element.

Following the second assessment of the methodology, First Environment subsequently reviewed version 1.9 of the Methodology Element, dated September 18th, 2012. First Environment is in agreement with the revisions made in version 1.9 of the Methodology Element.

Table of Contents

1 INTRODUCTION

This report is provided to Axios Mobile Assets (Axios) as a deliverable of the Verified Carbon Standard (VCS) methodology element (ME) assessment process for the proposed VCS ME entitled "Transport Energy Efficiency from Lightweight Pallets." This report provides a description of the steps involved in conducting the first methodology assessment as part of the VCS double-approval process and summarizes the findings of the first methodology assessment.

First Environment, Inc. (First Environment) was provided the current version of the ME dated August 12, 2011. Based on this document, the Audit Team performed a document review and desktop audit which resulted in corrective action requests (discussed later in this report) and revisions to the ME. The final version of the ME, dated April 23, 2012, serves as the basis of the final conclusions presented herewith.

1.1 Objective

The purpose of the methodology element assessment is to have an independent third party assess the conformance of the ME with VCS requirements.

1.2 Scope and Criteria

The methodology assessment scope is defined as an independent and objective review of the proposed ME. The methodology assessment is conducted using the *VCS Standard: VCS Version 3, 1 February 2012, v3.2* (VCS Standard) and the *VCS Methodology Approval Process, Version 3.3, 1 February 2012* (VCS Methodology Approval Process) as the criteria. The *VCS Program Guide Version 3.2, 1 February 2012* (VCS Program Guide) and the ISO 14064-2 and 14064-3 standards guided First Environment's process.

First Environment and Axios have agreed that a reasonable level of assurance be applied to this assessment.

1.3 Summary Description of the Methodology Element

The ME is applicable to project activities that involve either the replacement of an existing fleet of conventional pallets with lightweight pallets or the creation of a new fleet of lightweight pallets. Emissions reductions are achieved through a reduction in weight of freight transported using lightweight pallets compared to a baseline of conventional pallets. This weight reduction is translated to a reduction in fossil fuel consumption, and therefore, a reduction of anthropogenic carbon dioxide emissions. The ME provides procedures for establishing the project boundary, determining the baseline scenario, demonstrating additionality, monitoring fuel consumption and other relevant parameters, and finally, quantifying baseline and project emissions and total emission reductions.

2 ASSESSMENT APPROACH

2.1 Method and Criteria

The following assessment process was used:

- conflict of interest review;
- selection of assessment team;
- kick-off meeting with Axios;
- development of the validation plan;
- desktop review of the ME and other relevant documentation;
- follow-up discussions with Axios for supplemental information as needed as well as the corrective action cycle; and
- report development.

The validation process was utilized to evaluate whether the ME is consistent with the stated criteria. A methodology assessment checklist was developed which summarizes the criteria used to evaluate the ME, the conformance of the ME with each criterion, and the Audit Team's assessment findings.

Conflict of Interest Review

Prior to beginning any assessment project such as this, First Environment conducts an evaluation to identify any potential conflicts of interest associated with the project. No potential conflicts were found for this project.

Audit Team

First Environment's audit team consisted of the following individuals who were selected based on their assessment experience.

Lead Auditor – Michael Carim
Auditor – Iris Caldwell, Howard Kanter, Ross MacWhinney
Internal Reviewer – James Wintergreen

Audit Kick-off

The assessment process was initiated with a kick-off conference call on October 25, 2011 between First Environment and the primary Axios contact, John Psihos. The communication focused on confirming the assessment scope, objectives, criteria, schedule, and the information required for the methodology assessment.

Development of the Validation Plan

Based on the information discussed during the kick-off conference call, the Audit Team formally documented its validation plan and provided the validation plan to Axios.

Desktop Review

The Audit Team performed a desktop review of the ME and supporting documentation, as further described in Section 2.2 below.

Corrective Actions and Supplemental Information

The Audit Team issued requests for corrective action and clarification during the methodology assessment process, as described in Section 2.5. The corrective action and clarification requests and the responses provided are summarized in Section 4.

Validation Reporting

This methodology assessment report documents the methodology assessment process and identifies its findings and results.

2.2 Document Review

Eligibility requirements, baseline approach, additionality, project boundary, emissions, leakage, monitoring, data and parameters, and other pertinent criteria were assessed to evaluate the ME against VCS programme requirements. In order to inform the assessment, First Environment reviewed the references cited in the ME and other approved methodologies and a set of sample calculations that applied the quantification methodologies given in the ME. Discrepancies between the assessment criteria and the ME were considered material and identified for corrective action, as further described in Section 2.5.

2.3 Interviews

The Audit Team held teleconferences with the following individuals throughout the course of the methodology assessment:

- John Psihos – Axios
- Duncan Noble – PE International & Five Winds Strategic Consulting

2.4 Use of VCS-Approved Expert

A VCS-approved expert was not retained for the purposes of this methodology assessment. In accordance with the VCS Standard, a VCS-approved expert is not necessary for non-AFOLU ME assessments where a standardized method is not applied.

2.5 Resolution of Any Material Discrepancy

As described in Section 2.1, the Audit Team issued formal requests for corrective action, clarification, and supplemental information during the methodology assessment process. In particular, discrepancies between the ME and the VCS Standard were identified for corrective action and required appropriate justification. Clarification and supplemental information requests served to provide the Audit Team additional context or background information in order to complete the assessment process. Axios was given the opportunity to resolve raised issues through the submittal of additional evidence or justification, revisions to the ME, and/or other means as appropriate. The specific corrective action and clarification requests issued by the Audit Team, as well as the responses provided by Axios, are summarized in Section 4. As indicated, Axios adequately resolved all of these requests.

2.6 Internal Quality Controls

First Environment is an accredited validation and verification body by the American National Standards Institute (ANSI). This accreditation assures the quality controls inherent in the validation process, which includes an independent internal review process as required by the ISO 14064-3 standard. The Internal Reviewer, who is selected as a senior member of First Environment's staff, conducts a review of the methodology assessment activities and conclusions and confirms that they are consistent with the assessment criteria as well as First Environment's internal management procedures. All issues identified during the internal review are resolved before the issuance of deliverables to the client.

3 ASSESSMENT FINDINGS

3.1 Applicability Conditions

The ME clearly identifies criteria by which to assess the eligibility of pallet switch projects.

The criteria identified provide a clear basis for determining the ME's applicability to potential project activities. First Environment concluded that the applicability requirements given in the ME are appropriate, adequate, and consistent with the VCS Standard.

3.2 Project Boundary

The project boundary is defined by the truck fleets that carry lightweight pallets as part of their cargo, routes travelled by the fleet, and their consumption of fossil fuels.

The ME identifies relevant sources of baseline and project emissions and indicates whether each is included or excluded from the project boundary. First Environment determined that the ME provided sufficient criteria to establish the project boundary and that all relevant emission sources and GHGs are included.

3.3 Procedure for Determining the Baseline Scenario

The ME relies on the CDM "Combined tool to identify the baseline scenario and demonstrate additionality" (Combined Additionality Tool), a project method, to assess and determine the baseline scenario. Baseline alternatives are identified and evaluated in accordance with the Combined Additionality Tool and must be considered at a minimum:

- wood pallets, and
- petroleum-based plastic pallets.

A Barriers Analysis and, if needed, an Investment Analysis shall be used to determine the baseline scenario. The ME details additional guidance relative to the Investment Analysis. First Environment determined that this approach is appropriate and adequate.

3.4 Procedure for Demonstrating Additionality

The ME requires the use of the Combined Additionality Tool, a project method, in order to demonstrate project additionality. Because the CDM is considered an approved GHG programme under the VCS, First Environment considered the use of the Combined Additionality Tool an acceptable approach consistent with the VCS Standard.

3.5 Baseline Emissions

The ME provides procedures and equations for the calculation of baseline emissions. Specifically, baseline emissions are equivalent to the metric tonnes of carbon dioxide emitted to the atmosphere from fossil fuel combustion in the absence of the project activity. Baseline emissions are quantified using either a calculated Project Emission Factor or Default Emission Factor. The alternative quantification methodology, using a Default Emission Factor, may only be used if project specific fuel consumption or freight weight data are not available. An annual Project Emission Factor is calculated by dividing the total emissions from all fuels consumed in project vehicles by the annual aggregate weight distance of all freight transported by project vehicles. A baseline weight distance is calculated based on the total distance traveled by project vehicles, the total weight of project freight (including project pallets), the number of project pallets transported, and the incremental decrease in weight due to the pallet switch. The calculated baseline weight distance is then multiplied with the Project or Default Emission Factor to quantify baseline emissions.

First Environment reviewed the formulae and quantification methods for accuracy and concluded that the approach to calculate baseline emissions is appropriate, adequate, and consistent with the VCS Standard.

3.6 Project Emissions

Project emissions are quantified by multiplying the total quantity of fuel consumed by the fleet by the appropriate CO_2 emission factor. If fuel consumption data are not available, the ME provides an alternative procedure to quantify project emissions. A default CO_2 emission factor per short ton miles is multiplied by the aggregate products of distance traveled and total weight transported over all vehicles.

All formulas and quantification methods were reviewed for accuracy and appropriateness. First Environment concluded that the methodology's approach to calculate project emissions is appropriate and adequate.

3.7 Leakage

The proposed ME identifies and provides quantification methods for potential leakage emissions from the production of raw materials used to manufacturer lightweight pallets and from the actual manufacturing processes of the lightweight pallets. Leakage from the production of pallet raw materials is computed by

summing the product of the total number of purchased pallets, the mass of raw material consumed per pallet, and an upstream emission factor for each raw material used to manufacture the lightweight pallets. Leakage from the actual manufacturing processes is computed by summing the product of GHG activity level and its appropriate emission factor over all GHG sources.

Positive leakage sources are conservatively excluded from the ME. All formulas and quantification methods were reviewed for accuracy and appropriateness. First Environment concluded that the methodology's approach to calculate leakage emissions is appropriate, adequate, and conservative.

3.8 Quantification of Net GHG Emission Reductions and/or Removals

Emission reductions are calculated as project emissions and leakage emissions both subtracted from baseline emissions. Baseline and project emissions are aggregated across all vehicles carrying lightweight pallets in the given year. First Environment determined that this approach to calculate emission reductions is appropriate and adequate.

3.9 Monitoring

The monitoring of all data and parameters required to quantify emissions are described and appropriately defined in the proposed methodology. The proposed ME requires that all equipment used to monitor data such as freight plus pallet weights shall be calibrated in accordance with relevant industry standards. Additionally, the proposed ME specifies records retention for at least two years after the end of the last crediting period, consistent with VCS requirements.

First Environment determined that the monitoring approach is appropriate and adequate to obtain the necessary data for emission reductions quantification.

3.10 Data and Parameters

The proposed ME describes all data and parameters required for emission reductions quantification and classifies them as either available at validation (not monitored) or monitored.

The descriptions include source of data, measurement procedures, monitoring frequencies, default values where appropriate, and other comments necessary for project implementation or validation/verification. First Environment concluded that the data and parameters included in the proposed methodology and the associated requirements for measurement and monitoring are appropriate and sufficient to reduce uncertainty in emission reduction calculations.

3.11 Use of Tools/Modules

The proposed ME appropriately relies on the following CDM tools or elements from the tools in order to quantify emissions:

- combined tool to identify the baseline scenario and demonstrate additionality, and
- tool to calculate project or leakage CO2 emissions from fossil fuel combustion.

3.12 Adherence to the Project Principles of the VCS Program

The proposed ME was developed in accordance with the requirements of VCS and adequately addresses the principles of relevance, completeness, consistency, accuracy, transparency, and conservativeness.

3.13 Relationship to Approved or Pending Methodologies

The proposed ME draws upon elements of several approved CDM-methodologies. However, the degree to which these methodologies would have to be revised to incorporate the pallet-switch quantification methods and leakage estimates are substantial enough to warrant a new methodology. Axios provided ample justification as to the unreasonableness of revising any of these methodologies.

3.14 Stakeholder Comments

In accordance with the VCS requirement, a 30-day public stakeholder consultation was conducted from August 12 through September 13, 2011. No stakeholder comments were received for the proposed ME.

4 RESOLUTION OF CORRECTIVE ACTION REQUESTS AND CLARIFICATION REQUESTS

As described above, the Audit Team requested corrective actions, clarification, and supplemental information during the ME assessment process. The corrective action and clarification requests and the responses are summarized in the tables below.

Corrective Action Request	Summary of Methodology Developer Response	Validation Conclusion
The Methodology Element does not clearly state how it is based on the approved methodologies AMS-III.AA, AMS-III.S., ACM0017, and AM0090.	Section 1 of the ME was revised to clearly state which sections rely on other approved methodologies.	Response is acceptable.
The units in Equations (1), (2), (3), and (5) do not account for the conversion from short ton to metric tonnes and from "thousand short ton miles" to "short ton miles."	Axios clarified that the equations adequately account for the conversion from short ton to metric ton. The ME was revised by replacing all references to “thousand short ton miles” with “short ton miles” to make unit conversions consistent.	Response is acceptable.
$EF_{j,y}$ is incorrectly listed as a parameter available at validation.	The parameter was moved to the Data and Parameters Monitored section of the ME.	Response is acceptable.
The frequency of monitoring for parameter "M_x" listed in Section 9.2 is unclear because pallet specifications could change on a sub-annual basis.	A quality assurance procedure was added for parameter “M_x” to ensure the current pallet specifications are being used.	Response is acceptable.
Please provide further specificity in the applicability condition (Pallet Performance Requirements) used to determine whether a given lightweight pallet in the project scenario would be eligible under the Methodology Element.	The pallet performance applicability condition was revised to require that project pallets conform to the requirements of ISO 8611-2.	Response is acceptable.
Please provide justification for the applicability of the equations used to quantify baseline and project emissions in the instance where there is only partial substitution of the baseline pallet fleet (i.e., the project scenario contains both conventional and lightweight pallets).	Section 8.1 of the ME was revised to reflect that only trips involving a complete substitution of the baseline pallets with lightweight pallets may be quantified and that trips with partial substitution are not allowed.	Response is acceptable.

Corrective Action Request	Summary of Methodology Developer Response	Validation Conclusion
Please justify why applicability conditions in the Methodology Element are not necessary: • to control for the mass of freight transported in the baseline and project scenario; and • to ensure freight transported in the project activity is transported on pallets in the baseline scenario.	The mass of freight transported is assumed to be held constant between the baseline and project scenarios. The mass of freight transported will either be measured in the project scenario and would therefore be equivalent to the mass in the baseline scenario. If the alternate calculation methodology is used, the weight of freight transported does not factor into emissions quantification. A new applicability condition and QA/QC procedure were added to the ME to ensure freight would have been transported on pallets in the baseline scenario.	Response is acceptable.

Clarification Request	Summary of Methodology Developer Response	Validation Conclusion
Please clarify whether any assumptions, parameters, or procedures contained in the proposed Methodology Element have significant uncertainty, as per Section 4.1 of the VCS Standard.	Parameters DEF_y and EF_x were identified as having the potential for significant uncertainty. Guidance was added to the parameter tables in Sections 9.1 and 9.2 of the ME to manage uncertainty related to these factors in an appropriate manner.	Response is acceptable.
Please clarify how it will be demonstrated that the traffic density of routes travelled in the project scenario will not vary from the baseline scenario.	All references to traffic density were removed from the ME to avoid potential confusion or ambiguity.	Response is acceptable. Emission reduction quantification is based on the distance travelled; therefore traffic density is not relevant.
Please explain why the "Tool for the demonstration and assessment of additionality" is referenced in Section 7 of the Methodology Element while Section 6 refers to the "Combined tool to identify the baseline scenario and demonstrate additionality."	Section 7 of the ME was revised to reference the CDM "Combined tool to identify the baseline scenario and demonstrate additionality," consistent with Section 6.	Response is acceptable.

Clarification Request	Summary of Methodology Developer Response	Validation Conclusion
Please clarify in the Methodology Element whether the parameters PEF and P_p are determined ex-ante or ex-post.	Axios clarified that parameter PEF must be determined ex-post using four monitored parameters in accordance with equation (1). Parameter P_p is now included among the monitored parameters in Section 9.2 of the ME and will also be determined ex-post.	Response is acceptable.
Please clarify how it will be ensured that upstream manufacturers of lightweight pallets do not claim emission reduction credit under the Methodology Element.	The ME was revised to include an applicability condition that the project proponent must hold a contract with the fleet operator identifying ownership of emission reductions, where these parties are two differing entities.	Response is acceptable.
Please provide further clarification on the definition of conventional and lightweight pallets, including whether there is any restriction on project pallet composition (i.e., whether lightweight pallets be composed of wood and/or plastic) or minimum improvement in pallet weight that must be achieved by a project activity.	The applicability conditions section of the ME was revised to reflect that there are no restrictions on pallet composition or technology and that there is no minimum improvement threshold for pallet weight.	Response is acceptable.
Please clarify why Sections 8.1.1 and 8.2.1 provide an option for emission quantification where fuel data is unavailable when the applicability conditions in the Methodology Element specify that “vehicles are part of a captive fleet to enable monitoring of fuel consumption.”	The applicability condition requiring monitoring of fuel consumption in the captive fleet was removed from the ME.	Response is acceptable.
Please clarify whether a “trip” as conceived of by the Methodology Element consists of sole origin and destination points, or whether multiple destinations are possible in a single trip.	Section 8.1 of the ME was revised to explain that the weight of freight transported must remain constant during a 'trip.' This implies a 'trip' consists of a sole origin and destination.	Response is acceptable.
Please clarify the ramifications for a project activity should any of the conditions listed under the applicability conditions for “Fleet, Truck and Fuel Characteristics” be violated after the VCS crediting period is underway, and add monitoring parameters to the Methodology Element, as necessary.	The ME was revised to require that the project is declared complete with no potential for further emission reduction credits if any of the "Fleet, Truck, and Fuel Characteristics" applicability conditions are violated during the crediting period.	Response is acceptable.

5 ASSESSMENT CONCLUSION

First Environment performed the first methodology element assessment of the proposed ME as part of the VCS double-approval process. First Environment used the VCS Standard: VCS Version 3; the VCS Methodology Approval Process, Version 3.3; and the VCS Program Guide, Version 3.2 as the assessment criteria and to guide the methodology element assessment process.

The review of the proposed ME and the satisfaction of corrective action and clarification requests have provided First Environment with sufficient evidence to determine the fulfilment of stated criteria.

The proposed ME was prepared in accordance with the VCS Standard: VCS Version 3; the VCS Procedural Document Methodology Approval Process, Version 3.3; and the VCS Program Guide, Version 3.2. The proposed methodology belongs to Sectoral Scopes 3 – Energy Demand and 7 – Transport.

In summary, it is First Environment's opinion that the proposed ME entitled, "Transport Energy Efficiency from Lightweight Pallets," dated April 23, 2012, meets all relevant VCS requirements.

The methodology element assessment of the Project is based on the information made available to us and the engagement conditions detailed in this report. First Environment cannot guarantee the accuracy or correctness of this information. Hence, First Environment cannot be held liable by any party for decisions made or not made based on this report or opinion.

6 REPORT RECONCILIATION

In October 2012, First Environment was provided with a revised version of the methodology as a result of changes made during the second validation assessment. As the first assessor of the methodology, we support the changes resulting from the second validation, specifically the Methodology Element Version 1.9 dated September 18, 2012.

7 EVIDENCE OF FULFILMENT OF VVB ELIGIBILITY REQUIREMENTS

First Environment, Inc. holds accreditation to perform validation for projects under Group 01 (GHG emission reductions from fuel combustion), as defined by the American National Standards Institute (ANSI). First Environment has also completed more than ten previous methodology and project validations in ANSI Group 01. First Environment, therefore, is eligible under the VCS programme to perform assessments for the ME, which falls under Group 01.

8 SIGNATURE

Signed for and on behalf of First Environment on October 10, 2012.

Michael M. Carim
Associate

James Wintergreen
Senior Associate