September 2011

Maia Maia Emissions Reduction Currency System

Carbon Accounting Methodology

2011 Hulbert Street Sustainability Fiesta

1. Introduction

This report outlines methods used to estimate greenhouse gas emission reductions achieved by organisers of the 2011 Hulbert Street Sustainability Fiesta. Emissions reductions were calculated in order to back an issue of Boya by Fiesta organisers to residents and stallholders.

The report first identifies greenhouse gas emissions to be accounted for, before outlining accounting methods used. Calculated emissions reductions achieved through various actions taken by Hulbert Street residents are then presented.

2. 2011 Hulbert Street Sustainability Fiesta

The Hulbert Street Sustainability Fiesta was held on 24 and 25 September 2011. The aim of the Fiesta was to celebrate sustainable living and allow Hulbert Street residents who have taken steps to reduce their environmental footprint to share their stories with others.

Hulbert Street is Fremantle's "sustainable street". Many residents have taken action to reduce their household greenhouse gas emissions, including:

- installing solar panels
- cycling instead of driving
- composting food waste and keeping chickens.

The emissions reductions achieved through these activities in the year leading up to the 2011 Fiesta were estimated in order to back an issue of Boya by Fiesta organisers to residents.

3. Emissions to be Accounted For

The activities undertaken by Hulbert Street residents have brought about a net reduction in emissions of greenhouse gases to the atmosphere. Net emission reductions were estimated by calculating the level of emissions that would occur if the action was not carried out. For example, emission reductions achieved by using electricity from solar panels were estimated by calculating emissions that would occur if electricity was instead purchased from the grid.

In calculating changes in emissions, scope 1 emissions (those resulting directly from school/household activities) and scope 2 emissions (those resulting from the generation of electricity used in schools/households) will be accounted for. Scope 3 emissions will not be accounted for.

The principle of materiality was applied in defining the carbon flows to be accounted for. Actions that are expected to result in a material or significant change in carbon flows, over and above that which would occur if the action did not take place, were considered.

4. Accounting Methods

Accounting methods from the Greenbase Index of Methods and Standards (GIMS) were used to calculate emission reductions. GIMS is a compilation of emissions accounting methodologies used in various emissions reporting programs. GIMS is regularly updated to ensure that the current version of each method is used. The table below outlines actions taken by Hulbert Street residents, GIMS method used to calculate the resulting emissions reduction, and the source of each GIMS method.

Action	GIMS Method	GIMS Method Source
Households using solar energy from household solar panels	66-206-4-3	NGER Determination
Cycling instead of driving	35-10-4-1	Australian National Greenhouse Accounts

Composting and worm farming	35-58-4-3	Australian National Greenhouse Accounts

5. Uncertainty

Estimating emission reductions that have occurred due to actions taken by Hulbert Street residents involves uncertainty. Due to this uncertainty, the total calculated level of emissions reduction was reduced by approximately 30% prior to the issuing of Boya for the project.

6. Activity Data

Data on the kilowatt (kW) rating of solar power systems installed in Hulbert Street was collected. The electricity generated over a year by these systems was then estimated based on the average electricity output of solar panels in Perth (4.4 kWh per kW). By calculating the emissions that would occur if this electricity had been generated by fossil fuel power stations, the net reudction in emissoins brought about by using the solar panels was estimated.

Data was also collated on regular cycling trips made by residents in place of using a car. Emissions reductions from this activity were estimated using a method for calculating greenhouse gas emissions from vehicles based on distance travelled.

Data on quantities of food waste composted by an accommodation business in the street was collected. Emissions avoided by composting rather than sending waste to landfill were calculated using a method from the Australian National Greenhouse Accounts.

The table below summarises the data collected.

Activity 2010-2011	Data
Household solar panels	The following solar power systems are installed in the street: 1 x 1.2 kW rated system 8 x 1.5 kW rated systems 1 x 1.75 kW rated system 1 x 3 kW rated system 1 x 4.5 kW rated system Total = 22.45 kW 22.45 kW x 4.4 kWh per kW average for Perth x 365 days = 36,055 kWh
Cycling instead of driving	130 km per week x 52 weeks = 6,760 km
Composting food waste	2 x green bins per week x 52 weeks = 104 bins per year Bin volume is 240 L. Total of 24,960 L or 24.96 kL of waste per year Assume density of food waste is 343 kg/m^3[1] 24.96 m^3 x 343 kg/m^3 = 8,561 kg

7. Emissions Reductions

Calculated emissions reductions based on the methods outlined in Section 4 and the activity data in Section 6 are presented in the table below.

Activity	CO_2-e/#	#	t CO_2-e	Boya
Household solar panels	0.82 kg/kWh	36,055 kWh	29.565	2956
Cycling instead of driving	0.271 kg/km	6,760 km	1.832	183

[1] Source: EPA Victoria, http://www.epa.vic.gov.au/bus/erep/docs/wastematerials-densities-data.pdf, accessed 28 November 2011

Composting food waste	0.945 kg/kg scraps	8,561 kg	8.090	809
Subtotal			**39.487**	**3948**
Carbon reserve				-1184
Totals				**2764**

Only **1000 boya** have been issued at the Hulbert Street Sustainability Fiesta. The opportunity exists with further savings to achieve an additional 20 tonne or 50 tonne carbon reduction plan.

8. Other Issues

1. Leakage

This Project is not expected to result in leakage of carbon emissions. The activities forming the basis of this Boya issue involve replacing polluting forms of energy and transport with forms that do not produce greenhouse gas emissions. Therefore, leakage of emissions will not occur.

2. Additionality

Additionality is a concept defined by the United Nations Framework Convention on Climate Change (UNFCCC) in procedures for the Clean Development Mechanism (CDM). Under the CDM, project proponents must demonstrate that a project will result in reductions in greenhouse gas emissions beyond those that would have occurred in the absence of the project activity (UNFCCC 2006). This concept is relevant to Maia Maia ERCS projects in a general sense. It is not appropriate to require Boya Issuers to demonstrate whether a project would go ahead with or without the issue of Boya as a reward. However, some effort and resources are required to achieve emissions reductions, and this is what is being acknowledged and rewarded by the issuing of Boya. Boya are not issued for actions that happened in the past or that were undertaken by an unrelated third party.

9. References

UNFCCC 2006, *Modalities and procedures for a clean development mechanism* in *Report of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol on its first session, held at Montreal from 28 November to 10 December 2005*, UNFCCC.