GHG Inventory Report

Environmental IQ Covering the 2009 and 2010 Financial Years

Version 1.1

Assurance and Disclaimer

This report has been prepared in accordance with the latest industry standards and guidelines. Climate Catalysts assures that it has taken all reasonable steps to ensure the accuracy and integrity of data collection methods and calculations used. The report is based on various assumptions and input data from the client and its stakeholders. Climate Catalysts accepts no liability for inaccuracy with this data or the assumptions.

Document Name	Environmental IQ Carbon Audit_V1.1
Version Number	1.1
Date	7th September 2011
Written By	Gavin Pereira
Approved By	Andrew Barson

Executive Summary

Climate Catalysts was engaged by Environmental IQ to compiles a greenhouse gas inventory of its operations over the 2009 and 2010 financial years. The aim of the audit is to calculate the organisation's carbon footprint so that it can investigate emissions reduction options and determine the number of carbon credits it needs to offset its emissions.

Climate Catalysts' greenhouse gas audits are written in accordance to the Australian Government's National Carbon Offset Standard.[1] The NCOS standard prescribes best practice for greenhouse gas audits, emissions monitoring and carbon offsetting for organisations that wish to achieve carbon neutrality.

The greenhouse gas inventories were calculated through combining activity-level data for required emission sources (namely electricity, fuel combustion, flights, road-based transport, and paper usage) with emission factors and calculation methods that are prescribed within the NCOS standard.

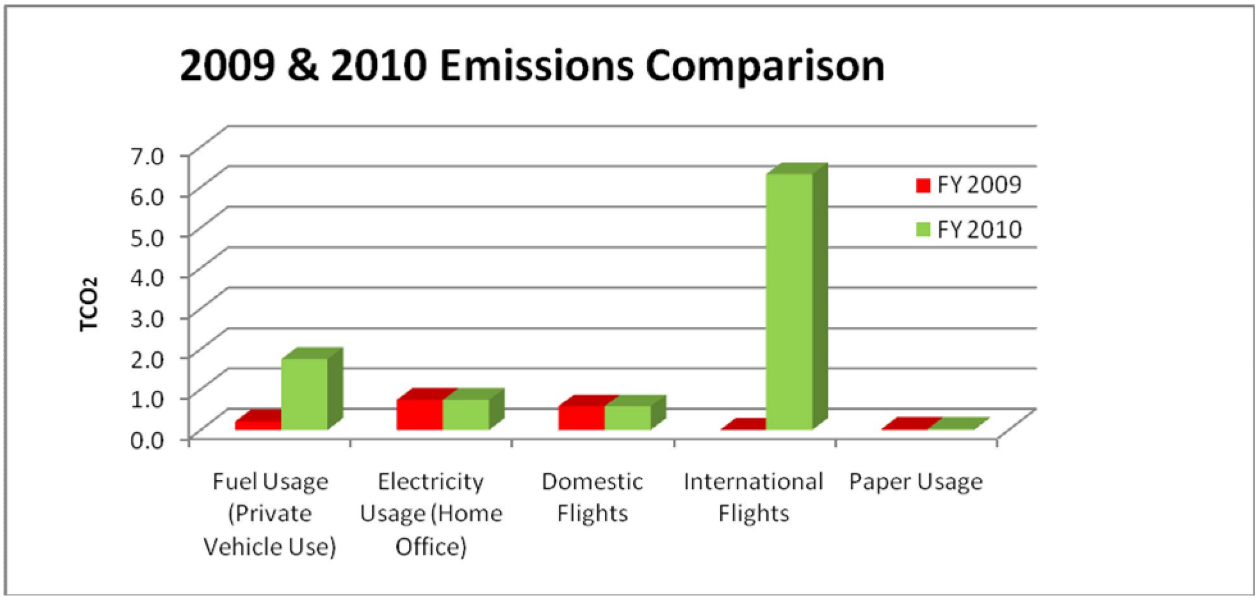
The greenhouse gas audit found that Environmental IQ was responsible for the emission of 1.55 tonnes of carbon dioxide-equivalent greenhouse gas in FY 2009 and 9.43 tonnes of in FY 2010. The emissions breakdown by emission source is shown below.

Table 1: Summary GHG Inventory FY 2009 and 2010

GHG Summary FY 09 and FY 10		
Emissions Source	**FY09**	**FY10**
Direct Scope 1 Emissions	**0.19**	**1.63**
Indirect Scope 2 Electricity Emissions	**0.62**	**0.62**
Indirect Scope 3 Emissions		
Fuel Usage (Private Vehicle Use)	**0.01**	**0.12**
Electricity Usage (Home Office)	**0.12**	**0.12**
Domestic Flights	**0.58**	**0.58**
International Flights	**0.00**	**6.32**
Paper Usage	**0.03**	**0.03**
Total	**1.55**	**9.43**

[1] Australian Government (2011), Carbon Neutral Program Guidelines: National Carbon Offset Standard, Commonwealth of Australia

Figure 1: Emissions Comparisons FY 2009 and 2010



The overall emissions from the operations in both financial years is very low; the source of emissions growth from financial year 2009 to 2010 was due to 3 international flights that were taken between Sydney and Singapore and increase in vehicle usage.

Environmental IQ's carbon footprint over the two financial years combined totalled 10.98 tonnes of CO2. Hence, by purchasing and retiring 11 carbon credits (that are compliant with the NCOS standard) Environmental IQ can claim to have neutralised the impact that the business has had towards climate change over the 2009 and 2010 financial years.

Table of Contents

List of Figures

List of Tables

1. Introduction

Environmental IQ has contracted Climate Catalysts to undertake a greenhouse gas assessment of its operations over the 2009 and 2010 financial years. The aim of the assessment is to quantify the total greenhouse gas impact that Environmental IQ is responsible for over the two financial years. Greenhouse gas (GHG) emissions consist of six measured gas types standardised in equivalent units of carbon dioxide (CO2-e). Whilst naturally occurring in the earth's atmosphere, additional and excessive CO2-e emissions from man-made (anthropogenic) activities are exacerbating the 'greenhouse effect' causing the 'global warming' phenomena and subsequent changes in the earth's climate.

That the planet is warming is a point that has been proven irrefutably by the scientific community. The 2009 State of the Climate Report[2] highlights the warming of a planet in a simple way. The report, which contained contributions from over *300 scientists from 160 research groups in 40 different countries* conducted analysis of 10 indicators that would show proof of a warming world. These are detailed and explained succinctly in the graphic below.

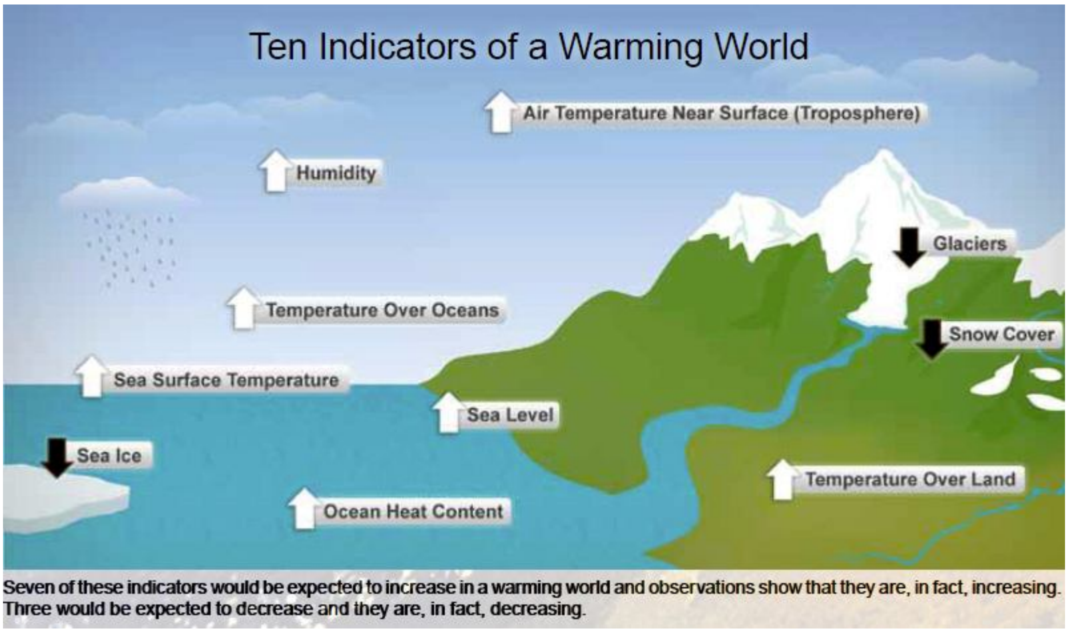


Figure 2: Ten Indicators of a Warming World (Source: NOAA)

[2] National Oceanic and Atmospheric Administration 2010, 2009 State of the Climate Report, NOAA, United States Department of Commerce. Online resource, accessed on 13th July 2011 at: http://www.noaanews.noaa.gov/stories2010/20100728_stateoftheclimate.html

That the planet's warming is due to the release of greenhouse gas by humans has also been credibly established. The 2007 Intergovernmental Panel on Climate Change's fourth assessment report published that it was very likely[3] (greater than 90% certainty)[4] that most global warming experienced since the mid-20th century was due to human greenhouse gas emissions. The same IPCC report lists the impacts of future climate changes, citing with at least:

- 90% certainty that there would be more warm spells and heat waves, as well as more heavy rain events
- 66% certainty that there would be more areas affected by drought increases, intense tropical cyclone activity increases and increased incidence of extreme high sea levels (including tsunamis)[5]

The above activities would lead to increased risk of heat mortality, increased erosion and damage to crops, increased risk of water and food-borne diseases and increased potential for movement of populations (or environmental refugees). [6]

In this context and with a view to reducing GHG emissions, policy responses from governments have seen the introduction of emissions trading programs, regulations and standards for compliance on energy efficiency and emissions. At the time of writing, the minority federal Labor government had reached agreement with key independents on carbon tax and emissions trading scheme legislation which it hopes to pass through the Australian parliament. If successful, the legislation will bring about a formal price and cap on carbon pollution within Australia.

Increasingly, private and public organisations have taken the initiative to measure and counteract the impact that their activities are having towards climate change. A carbon audit can be the foundation of an effective climate change program. It enables organisations to assess the climate change impact that they have, track and communicate their progress and create a strategy to reduce emissions by measurable amounts.

1.1 About Environmental IQ

Environmental IQ is a consulting firm that provides tailored advice to companies to assist them in reducing their electricity usage and their impact towards climate change. This carbon audit will give Environmental IQ insight on its own impacts towards climate change, allowing it to walk the walk by identifying its own emissions profile and applying common-sense strategies to lower its carbon footprint.

---

[3] IPCC (2007), Climate Change 2007: Synthesis Report, Summary for Policymakers, p5
[4] IPCC (2007), Climate Change 2007 Synthesis Report, p27
[5] Ibid, p53
[6] Ibid

2. Carbon Accounting Standards

The National Carbon Offset Standard, published by the Australian Government, provides best practice guidance to organisations that wish to become carbon neutral, or that wish to make their products carbon neutral. The standards prescribes the emission sources that an organisation must take account of, as well as defining how an organisation establishes it's emission boundaries (that is, the emission sources that it owns).

The NCOS standard refers to *Australian standard AS ISO 14064.1 – 2006: Greenhouse Gases Part 1- specification with guidance at the organisational level for quantification and reporting of greenhouse gas emissions and removals* as well as the National Greenhouse and Energy Reporting Act 2007.

2.1 Emission Sources under NCOS

The NCOS standard states that an organisation should account for the emissions sources that it would ordinarily account for under NGER (that is, scope 1 and scope 2 emission sources) as well as certain scope 3 emissions sources. In carbon accounting, emissions are separated into different scopes so that organisations have a clear understanding of the level of control that they have over the emissions resulting from their operations.

To assist organisations with detailing and compiling greenhouse gas inventories, in 2004, the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD) developed the Greenhouse Gas Protocol.[7] The emissions scopes (as defined by the GHG Protocol) are illustrated and explained in detail below.

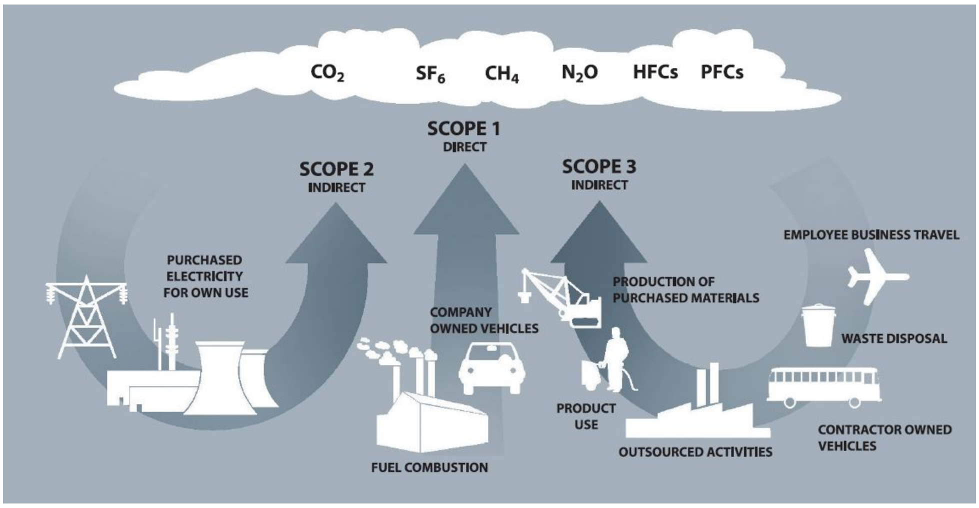


Figure 3: Scopes under the GHG Protocol (pg 26, GHG Protocol)

---

7 World Resources Institute and World Business Council for Sustainable Development 2004, *Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard - 2004*

The three scopes under the GHG Protocol[8] are described below:

- Scope 1 or direct emissions occur from sources (typically the combustion of fuels) owned or controlled by an organisation
- Scope 2 or energy indirect emissions occur as a result of purchased energy
- Scope 3 or other indirect emissions occur as a consequence of the activities of an organisation but from sources not owned or controlled by them. The accounting and reporting of scope 3 emissions should focus on "those activities that are relevant to ... business and goals, and for which" ...there is ... "reliable information."[9]

2.2 Emission Boundaries

The NCOS states that an organisation must establish its GHG inventory in accordance with the guidance provided by the ISO:14064.1.[10] The standard states that an organisation can define the boundaries of its greenhouse gas emissions from the facilities over which it has operational or financial control. For the purposes of this audit, organisational control will be determined using a financial control rationale. This means that if Environmental IQ purchase or pay for a service from a facility, then the resulting emissions belong to Environmental IQ.

This is the most simple method for Environmental IQ to utilise when demarking control as its major emission sources come from assets and items that are not owned by the company. Hence, rather than disown emissions due to them not being under 'operational' control, a financial control rationale allows these emissions to be captured and the responsibility for them attributed to Environmental IQ.

2.3 Summary of Emissions Sources and Scopes Accounted for Environmental IQ

Combining points 2.1 and 2.2 above, the table below summarises the emission sources that Environmental IQ will be accounting for and the scope that they fall under.

[8] Ibid, p.26
[9] WRI/WBCSD, (2004), p.29
[10] NCOS, p6

Table 2: Summary of Included Emission Sources

Emissions Sources	Scope	Mandatory Inclusion Under NCOS?
Gas and Fuel Combustion in Vehicles	Scope 1	Yes
Emissions from electricity usage	Scope 2	Yes
Upstream emissions from all fuel and electricity usage	Scope 3	No
Emissions from flights	Scope 3	Yes
Embodied emissions in paper	Scope 3	Yes
Emissions from decomposition of waste	Scope 3	Yes

3a. GHG Inventory Environmental IQ 2009 Financial Year

Environmental IQ Greenhouse Gas Inventory FY 2009				
Emissions Source	**Consumption**	**Units**	**Emission Factor (kgCO2 /Unit)**	**Carbon Dioxide Equivalent (tCO_2^{-e})**
Direct Scope 1 Emissions (Private Vehicle Usage)	80.09	L	2.380	**0.19**
Indirect Scope 2 Electricity Emissions	700.00	kWh	0.890	**0.62**
Scope 3 Fuel & Electricity Emissions				
Fuel Usage (Private Vehicle Use)	80.09	L	0.180	**0.01**
Electricity Usage (Home Office)	700.00	kWh	0.170	**0.12**
Domestic Flights	3108.68	pkm	0.187	**0.58**
International Flights	0.00	-	0.000	**0.00**
Paper Usage	14.00	kg	1.867	**0.03**
Total Scope 3 Emissions			0.170	**0.74**
Total Footprint (Scope 1 + Scope 2 + Scope 3)				**1.55**

3b. GHG Inventory Environmental IQ 2010 Financial Year

Environmental IQ Greenhouse Gas Inventory FY 2010				
Emissions Source	**Consumption**	**Units**	**Emission Factor (kgCO2 /Unit)**	**Carbon Dioxide Equivalent (tCO_2^{-e})**
Direct Scope 1 Emissions	686.67	L	2.380	**1.63**
Indirect Scope 2 Electricity Emissions	700.00	kWh	0.890	**0.62**
Scope 3 Fuel & Electricity Emissions				
Fuel Usage (Private Vehicle Use)	686.67	L	0.180	**0.12**
Electricity Usage (Home Office)	700.00	kWh	0.170	**0.12**
Domestic Flights	3108.68	pkm	0.187	**0.58**
International Flights	41234.70	pkm	0.153	**6.32**
Paper Usage	14.00	kg	1.867	**0.03**
Total Scope 3 Emissions				**7.17**
Total Footprint (Scope 1 + Scope 2 + Scope 3)				**9.43**

*Emissions from Waste were zero in both years.

4. GHG Emissions, Sinks and Offsets Quantification

The greenhouse gas audit of Environmental IQ involved the collection of activity level data with regards to fuel combustion, electricity usage, paper usage, waste generation, road transport, flights and waste. The above activity level data on the above sources is then multiplied by appropriate emission factors to determine the emissions from each source. All data was supplied over email by Environmental IQ's director, Bill Downing.

The following chapter describes how each emission source was calculated for each different emission scope for the two financial years (2009 and 2010) under consideration.

4.1 Scope 1 Emissions: Fuel Combustion

Environmental IQ reported its vehicle type (2006 Model 4 Cylinder Rav 4) and the number of kilometers traveled in each financial year. Climate Catalysts looked up the *Green Vehicle Guide* to determine the fuel rating of the 2006 Year model Rav 4, which was stated as having an overall rating of 9.6 litres per 100 kilometers, or 0.096 litres per kilometer.[11] The overall kilometers driven in each financial year (834.29 kilometers in FY 2009 and 7152.86 in FY 2010) were divided by the fuel efficiency to provide the total number of litres of petrol used in each financial year (80.09 in FY 2009 and 686.67 in FY 2010).

The following equation is used to calculate GHG emissions from fuel combustion:

$$E_{ij} = \frac{Q_i \times EC_i \times EF_{ij}}{1000}$$

where:

- E_{ij} = emissions from fuel type (j) – CO_2, NH_4, N_2O, measured in tonnes of CO_2-e (i)
- Q_i = quantity of fuel type (i) (kilolitres or gigajoules) combusted
- EC_i = energy content factor of fuel type (i) (gigajoules per kilolitre or per cubic metre)
- EF_{ij} = emission factor for each gas type (j) for fuel type (i) (kilograms CO_2-e per gigajoule)

As outlined by the formula above, emissions from fuel usage are the product of the quantity of fuel and the emissions factor. Emission factors for different fuel types were collected from the Department of Climate Change's National Greenhouse Accounting Factors Workbook.[12]

[11] http://www.greenvehicleguide.gov.au

[12] Australian Government July 2011, "National Greenhouse Accounts (NGA) Factors", Department of Climate Change and Energy Efficiency, Canberra, p16 for liquid fuels, p 14 for Natural gas

The fuel consumption data and the resulting emissions are summarised in the table below.

Table 3: Scope 1 emissions from Fuel Usage

Year	Litres of Petrol	Scope 1 EF kgCO2/ L	TCO2e
FY 2009	80.09	2.38	0.19
FY 2010	686.67	2.38	1.63
		Total	1.82

4.2 Scope 2 Emissions: Electricity Consumption

The scope 2 emissions from purchased electricity are those that result from the combustion of fuel at the power station that delivers the electricity that is consumed. The formulae by which electricity emissions are calculated is shown below:

where:
$$Y = Q \times \frac{EF}{1000}$$

- Y = emissions measured in tonne of CO_2-e
- Q = quantity of electricity purchased in kilowatt hours (kWh)
- EF = emission factor (scope 2 or 3) for NSW CO_2-e per kWh

The scope 2 emission factor for electricity in NSW, as listed in the NGAF Workbook is 0.89 kgCO_2-e per kWh.[13] A daily usage of 2 kWh was provided for a total of 350 days in the year. The calculations for Environmental IQ's electricity usage over the 2 financial years is shown in the table below.

Table 4: Emissions from Electricity Usage

Year	kwh/ day	days/ yr	Total kWh	Scope 2 EF kgCO2/ kWh	Scope 2 TCO2e
FY 2009	2	350	700	0.89	0.623
FY 2010	2	350	700	0.89	0.623
				Total	1.246

4.3 Scope 3 Emissions: Fuel Usage and Electricity

Electricity usage and fuel usage each result in scope 3 emissions that occur upstream from the point of use. In the case of electricity, scope 3 emissions result from wasted electricity that is lost during transmission and

13 NGAF 2011, p20

distribution of consumed electricity (between the power generation source and the final point of use). In the case of fuel, scope 3 emissions occur due to energy consumed and the resultant emissions from processing and refining consumed fuels. Further emissions can occur from leakage of fuel in transmission to the point of final usage.

The NGAF workbook provides emission factors for the scope 3 emissions impact of consumed electricity and combusted fuel.[14] The scope 3 emissions impact from fuel and electricity usage are the product of total fuel/electricity usage and the associated emissions factor. The table below details the scope 3 emissions impact from fuel and electricity usage.

Table 5: Scope 3 Emissions from Combusted Fuel and Consumed Electricity

Emissions Source	Consumption	Units	Emission Factor (kgCO2 /Unit)	Carbon Dioxide Equivalent (tCO_2^{-e})
Fuel Usage (Private Vehicle Use) FY 2009	80.09	L	0.18	0.01
Fuel Usage (Private Vehicle Use) FY 2010	686.67	L	0.18	0.12
Electricity Usage (Home Office) FY 2009	700.00	kWh	0.17	0.12
Electricity Usage (Home Office) FY 2010	700.00	kWh	0.17	0.12

4.4 Scope 3 Emissions: Flights and Air Freight

On a global scale, emissions from air travel have grown at an alarmingly high rate. A study on the Aviation sector's future contribution to climate change by the Australian National University projects that aviation emissions will rise by 110 per cent between 2005 and 2025. [15] If this is true, controlling aviation emissions will become a major concern for governments with emission reduction targets.

Emission calculations from air travel take into account a number of influencing factors, namely the distance (total kilometers and whether the flight is short, medium or long-haul which affects the engine types and the fuel loading); cargo weight, the seating class and imperfect flight path taken by planes. Another factor that impact's carbon footprint calculations is the effects of 'radiative forcing' of GHG emissions from aircraft. Aircrafts are found to emit non-CO_2 releases (such as CO,NO_x and H_2O) that also have a climate change impact when released into the atmosphere, but have a variable global warming impact that is difficult to standardise into Carbon Dioxide equivalents.[16]

[14] NGAF 2011, Pp67 and 68 provide scope 3emission factors for all listed fuels, natural gas and electricity
[15] Australian National University, 2008, "International Aviation Emissions to 2025; Can Emissions be Stabilised Without Restricting Demand?", piii
[16] In-depth explanations of radiative forcing can be found in ANU 2008, pp3-4 and DEFRA 2008, pp13-14

The UK government Department of Environment, Food and Rural Affairs has published guidance for the calculation of greenhouse gas impacts from flying, that account for the weighting of different seat classes as well as the efficiency of short, medium and long haul passenger aircraft. These emission factors are published below.

Table 6: Seating class based CO2 Emission Factors for Passenger Flights[17]

Flight type	Size	Load Factor%	gCO_2 /pkm	Number of economy seats	% of average gCO_2/pkm	% Total seats
Domestic	**Average**	**65.3%**	**175.3**	**1.00**	**100%**	**100%**
Short-haul	**Average**	**81.2%**	**98.3**	**1.05**	**100%**	**100%**
	Economy class	81.2%	93.7	1.00	95%	90%
	First/Business class	81.2%	140.5	1.50	143%	10%
Long-haul	**Average**	**78.1%**	**110.6**	**1.37**	**100%**	**100%**
	Economy class	78.1%	80.7	1.00	73%	80%
	Economy+ class	78.1%	129.1	1.60	117%	5%
	Business class	78.1%	234.0	2.90	212%	10%
	First class	78.1%	322.8	4.00	292%	5%

The DEFRA report provides emission factors in 'grams of CO2 per kilometre'. To calculate the distance travelled by an aircraft, the DEFRA standard recommends that the Greater Circle Distance formula be applied (which is the formula that calculates the shortest distance between 2 points on a sphere's perimeter). The DEFRA standard recommends that a factor 1.09 be applied to the GCD distance to account for uplift and the imperfect path taken by planes. Finally, the DEFRA standard explains that, if an entity wishes to account for the effects of RFI, then it should apply a factor of 1.9 to the emissions calculation, which is in-line with best available scientific evidence.[18] Combining the above factors, formulae for calculating emissions from flights then becomes:

Y = D x 1.09 x 1.9 x EF x P, where:

- Y = emissions from flight (expressed in tCO2e)
- D = greater circle distance
- EF = applicable seating class emission factor (from table 8 above) expressed in TCO2e
- P = number of passengers

The greater circle distance (distance between 2 points) was calculated using the "Travel Math" distance calculator, which uses the same algorithm for calculating distance as most GPS systems.[19]

The emissions from flights is shown in the table below..

[17] UK Government, 2008, 2008 Guidelines to DEFRA's GHG Conversion Factors, Methodology Paper for Transport Factors, Department of Food, Environment and Rural Affairs, p11
[18] DEFRA, p14
[19] Travelmath, Online resource, viewed 5th July 2011. Available at: http://www.travelmath.com/flight-distance/

Table 7: Emissions from Flights for FY 2009

City of origin	city of destination	Return or one Way	One Way Distance	Class	Emission Factor (kgCO2 /km)	Distance Km	# of Trips	Pass-km (adj by 1.09)	RFI	TCO2e
Melbourne	Sydney	Return	713	Economy	0.0983	1426	2	3109	1.9	0.6
							Total	3109		0.6

Table 8: Emissions from Flights for FY 2010

City of origin	city of destination	Return or one Way	One Way Distance	Class	Emission Factor (kgCO2 /km)	Distance Km	Number of Trips	Pass-km (adj by 1.09)	RFI	TCO2e
Melbourne	Sydney	Return	713	Unknown	0.0983	1426	2	3109	1.9	0.6
Singapore	Sydney	Return	6305	Economy	0.0807	12610	3	41235	1.9	6.3
							Total	44343		6.9

4.5 Scope 3 Emissions: Embodied Emissions in Paper

The NCOS standard recommends that organisations include the embodied emissions from paper consumption in their greenhouse gas inventories when preparing them for carbon neutrality.[20]

The emission factor utilised for paper was that of paper stocks of Virgin fibre content, which, according to EPA Victoria has an embodied emissions impact of 1.867 kg of CO2-e per kilogram of paper.[21] Environmental IQ reported a total of 5 reams of paper in each of the financial years considered in this audit, which EPA Victoria estimates to weigh 2.8 kilograms per ream. The emissions calculations from paper usage are shown in the table below.

Table 9: Embodied emissions from Paper Usage

# Reams	kg/Ream	kg paper	kgCO2/kg	tCO2e
5	2.8	14	1.867	0.03

[20] NCOS, p20

[21] EPA Victoria, Online resource, accessed 10th July 2011. Available at: http://epanote2.epa.vic.gov.au/EPA/publications.nsf/2f1c2625731746aa4a256ce90001cbb5/a8a9bf6c78cd6225ca257826001028ab/$FILE/1374.pdf Recommended scope 3 emissions data source by NCOS, p24

4.6 Scope 3 Emissions: Waste

When organic matter decomposes in a landfill in the absence of oxygen, methane gases are emitted. Methane is a dangerous greenhouse gas, with a global warming impact that is 21 times higher than Carbon Dioxide for each tonne that is emitted.[22] Hence, waste generation from a business entity has the potential to be a significant contributor to a business' carbon footprint. Environmental IQ reported zero waste for both financial years, meaning an overall emissions impact of zero tonnes of CO2-e per year from waste generation.

4.7 GHG Sinks and Offsets

Environmental IQ did not have any emissions sinks that sequestered emissions during its operations.

[22] United Nations Framework Convention on Climate Change, 2011, online resource, accessed 14th July 2011. Available at: http://unfccc.int/ghg_data/items/3825.php Comparison between CO2 and CH4 is made on a 100-year time horizon (which is the standardised period for comparison with CO2).

5. Conclusion

Environmental IQ commissioned Climate Catalysts to conduct a greenhouse gas audit of its operations over the 2009-10 and 2010-11 financial years. The audit covered greenhouse gas emissions from scope 1 and scope 2 emission sources as well as scope 3 emission sources of flights, upstream emissions from consumption of fuel and electricity; emissions embodied in paper and emissions from the decomposition of waste in landfill.

The audit found that the combined footprint for the 09/10 financial year was 1.55 tonnes of CO2-e and 9.43 tonnes of CO2-e in the 10/11 financial year. The combined emissions from the two financial years totalled 10.98 tonnes of CO2-e.

By purchasing 11 carbon credits from projects that meet the NCOS standard, Environmental IQ can offset the combined carbon footprint from the two previous year's operations. By dong this, Environmental IQ will be showing leadership in the business community on climate change.

6. References

Australian Government (2011), Carbon Neutral Program Guidelines: National Carbon Offset Standard, Commonwealth of Australia [Information on NCOS Standard]

Australian Government July 2011, "National Greenhouse Accounts (NGA) Factors", Department of Climate Change and Energy Efficiency, Canberra [Emission Factors for numerous emission sources]

Australian National University, 2008, "International Aviation Emissions to 2025; Can Emissions be Stabilised Without Restricting Demand?" [Information on aviation growth and RFI]

EPA Victoria, Online resource, accessed 10th July 2011. Available at: http://epanote2.epa.vic.gov.au/EPA/publications.nsf/2f1c2625731746aa4a256ce90001cbb5/a8a9bf6c78cd6225ca257826001028ab/$FILE/1374.pdf [Recommended scope 3 emissions data source for paper by NCOS,]

Intergovernmental Panel on Climate Change (2007), Climate Change 2007 Synthesis Report, p27 [Facts on the impacts of climate change]

IPCC (2007), Climate Change 2007: Synthesis Report, Summary for Policymakers, p5 [Description of likelihood of climate modelling and consequences]

AS ISO 14064.1, 2008, "Australian Standard: Greenhouse gases, Specification with guidance at the Organisational Level for quantification and reporting of greenhouse gases" [Utilised for guidance on greenhouse gas calculations]

National Oceanic and Atmospheric Administration 2010, 2009 State of the Climate Report, NOAA, United States Department of Commerce. Online resource, accessed on 13th July 2011 at: http://www.noaanews.noaa.gov/stories2010/20100728_stateoftheclimate.html [Chart of climate change indicators]

Travelmath, Online resource, viewed 5th July 2011. Available at: http://www.travelmath.com/flight-distance/

UK Government, 2008, 2008 Guidelines to DEFRA's GHG Conversion Factors, Methodology Paper for Transport Factors, Department of Food, Environment and Rural Affairs, [Source of information for flights calculations and RFI]

United Nations Framework Convention on Climate Change, 2011, online resource, accessed 14th July 2011. Available at: http://unfccc.int/ghg_data/items/3825.php Comparison between CO2 [Global warming potential of methane]

World Resources Institute and World Business Council for Sustainable Development 2004, *Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard – 2004* [Carbon accounting standard]