GREEN CAPITAL

ADVANCING CORPORATE SUSTAINABILITY

AN INITIATIVE OF TOTAL ENVIRONMENT CENTRE

Neutral & Beyond

A Review of Carbon Neutrality and Offsets

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About Green Capital and the Total Environment Centre (TEC)

The Total Environment Centre is a non-profit community organisation that has been campaigning on a wide range of environmental issues over the past 30 years. The organisation has worked on issues such as wood chipping, native forest, water, energy, transport, the national electricity market and chemicals.

In 2002 TEC recognised that it needed to engage with the business sector on issues of sustainability with a view to ensuring business became more sustainable. It established the Green Capital program for that purpose. The program runs a quarterly debate series as well as research, training and advocacy projects on specific issues of corporate sustainability. For more information visit: www.greencapital.org.au

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Introduction

Every day another company is stating their intention to go carbon neutral from News Corp. to Marks & Spencer and Australian companies such as IAG, NAB, Westpac and ANZ. There are even more companies that decide to delve into offsets without contemplating neutrality–so what is the difference, if any, between companies that offset only and companies that aim for neutrality?

Carbon neutrality and offsetting seems like a Pandora's box of contradictory issues that poses more questions than it solves. To offset or not to offset, and which offset–it increasingly seemed to be an ethical issue for organisations. How does a business calculate its carbon equivalent emissions and how far up or downstream do they need to go?

The moveable feast of offsets available are also confusing–from tree-planting, methane-capture and flaring to renewable energy. The variance in price of these offsets provides no clarity either. Should you go for the least expensive offset or the offset that best matches your business aims? And which ones are reputable?

With the global offset market expanding by 300% between 2005 and 2006, it is estimated that the market will be worth in excess of US$600 million in just three years. It soon became obvious to us that offsets differ as much in quality, reputation and reliability as they do in price.

This confusion prompted a research paper by TEC called *Carbon Neutral Watch* and the subsequent quarterly debate – *Going Carbon Neutral*. This paper seeks to delve into some of these issues with a broad spectrum of opinion on carbon neutrality and hopefully will shed some light on the surrounding issues of offsetting, reliability and steps to neutrality.

We would like to thank all our contributors. We encourage people to send any additional thoughts and ideas to us at Green Capital. Your contribution as an individual, organisation or community group would be invaluable to the enrichment of the debate and future directions of carbon neutrality.

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Definitions

CO_2-e

CO_2-e literally means carbon dioxide or equivalent gas. As carbon dioxide is the most common greenhouse gas (GHG) in the atmosphere it is used as the base gas for calculating GHG levels.

Methane is also a greenhouse gas and although it is present in much smaller amounts, its greenhouse causing impact is twenty three times that of carbon dioxide. Below is a brief description of the GHGs and their equivalent measure of carbon dioxide.

1 tonne of gas	CO_2-e (Equals tonnes of CO_2)
Carbon Dioxide	1
Methane	23
Nitrous Oxide	296
HFC-23	12,000
HFC-125	3,400
HFC-134a	1,300
HFC-143a	4,300
HFC-152a	120
HFC-227ea	3,500
HFC-236fa	9,400
Perfluoromethane (CF4)	5,700
Perfluoromethane (C2F6)	11,900
Sulfur Hexafluoride (SF 6)	22,200

Offsets

According to the Oxford Dictionary, an offset is a consideration or amount that diminishes or balances the effect of a contrary one. The verb offsetting is similar to counterbalancing or the action of compensating.

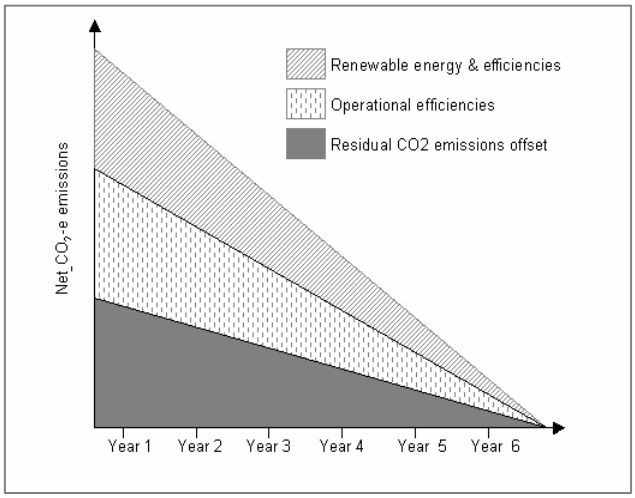
In our definition, an offset is a unit of saved, abated or sequestered carbon equivalent greenhouse gas that is then sold to an individual or organisation wishing to compensate for the same amount of emitted carbon equivalent greenhouse gas. An offset must also satisfy additionality criteria by demonstrating that the action, activity or project that created the offset would not have occurred anyway.

Carbon neutral(ity)

Net emissions equal to zero. In other words, where an organisation or an individual has reduced their net emissions to zero.

In the graph to the right a company's net emissions from production, distribution and operational consumption of energy from facilities as well as energy from secondary sources such as accommodation, travel etc are measured.

By switching to green power and implementing an efficiency program a company can reduce their net emissions. By offsetting the remaining residual emissions a company purchases the equivalent CO_2 tonnage and effectively reduces their net emissions to zero.



Carbon negative

A company offsets above the level of CO_2 they produce which creates a surplus. Some companies, such as waste landfill operators that produce enough renewable energy from their methane-capture and flaring operations can then produce renewable energy credits above their operational needs–making the company carbon negative.

Carbon sinks

A carbon sink is a pool (reservoir) that absorbs or takes up released carbon from another part of the carbon cycle. The three main natural sinks are oceans, plants and soil. Carbon sinks are those activities that absorb carbon dioxide from the atmosphere and recapture it into the natural cycle.

Carbon sources

A carbon source is the opposite to a carbon sink. In other words, a carbon source is anything that emits carbon into the atmosphere rather than removing it.

Why go carbon neutral or offset?

Why carbon matters

There are three main factors that contribute to global climate change: the sun (by which we receive heat); the atmosphere (stabilises the temperature); and the oceans (which sequester CO_2 and transfer moisture around the globe).

Even though the sun's output has increased by 30% over the past 400 000 years, the Earth's temperature has managed to remain steady. This is due to the ability of the atmosphere and oceans to regulate global temperatures. During this period of relative calm the carbon dioxide levels in the atmosphere have remained relatively steady.

As of January 2007 the atmospheric concentration of CO_2 [1.] is 383 parts per million (ppm) – this is only carbon dioxide not the total CO_2-e which includes the other greenhouse gases. To put this in perspective, from 1911 to 2004, the atmospheric CO_2 concentration has increased from 300 ppm to 377 ppm or about 25%, with most of it released since 1966. In contrast from 1832 to 1911, the increase was from 284 to 300 ppm, which is only about 6%. Overall, the amount of atmospheric CO_2 has increased by 31%, and methane has increased 150% from pre-industrial (1750) levels[2]. Increasing levels of CO_2 effectively trap more heat in the atmosphere causing glacial melt, rising sea-levels and increasingly severe weather events.

According to the Stern Report, CO_2-e is at 430 ppm and is on average rising by approximately 2 CO_2-e points very year. To limit climate change and global temperature increases to only 2 degrees Celsius, it is recommended that we stabilise CO_2-e at 450ppm – it is clear the time for action is now.

Tipping points

As John Schellnhuber, the research director at the Tyndall Centre for Climate Change Research in Britain pointed out, increased levels of greenhouse gases could cause "tipping points". These are the Achilles heels of the planet, when climate change could produce sudden and dramatic environmental damage.

Tipping points are when an area under crisis due to climatic changes become so weak that the checks and balances that held it in place collapse – a previous carbon sink becomes a carbon source. The bogs of Siberia are a good example of this (http://www.guardian.co.uk/climatechange/story/0,12374,1546824,00.html)

To avoid climatic changes the Kyoto Protocol has set up targets for each country.

[1.] http://www.esrl.noaa.gov/gmd/ccgg/trends/

[2] http://www.acidrain.org/pages/publications/factsheet/factsheet11.htm

Reductions Required by Kyoto Protocol

Country	Required change 1990-2010	Observed change 1990-1999
Britain	-12.5%	-14.5%
Germany	-21.0%	-18.9%
France	0	-2.2%
Italy	-6.5%	+5.4%
Canada	-6.0%	+15.0%
Japan	-6.0%	+11.2%
United States	-7.0%	+11.7%
Russian Federation	0	-38.5%
Ukraine	0	-55.0%

Data from UN Framework Convention on Climate Change Table of National Communications, 1999

Scientists agree that climate change is happening, what they don't agree on is how fast it is happening.

This is of great concern to the business world and already many companies are recognising the need to err on the side of caution and take action. One thing everyone can agree on is that business likes certainty and few are willing to bet on climate change *not* happening.

Risk, consumer concern and the dollar

2006 saw the first big change in general consumer awareness of climate change and its impacts. *An Inconvenient Truth,* cyclone Larry in Queensland, cyclone George in WA in 2007 as well as freak hail storms in Canberra and extended drought combined to bring home the impacts of climate change to the everyday Australian. The Lowy Report from October 2006 revealed that 90% of Australians are not only concerned but willing to be economically impacted to find a solution to climate change.

For many organisations this increased awareness by consumers has prompted calls for carbon neutrality. Stuart Rose the CEO of Marks & Spencer's (like many other organisations) believes that "responsible business can be a profitable business. We are calling this (carbon neutrality) "Plan A" because there is no 'plan B'."

Many companies abroad and at home like Tesco, HSBC, IAG, NAB and even NewsCorp are looking at the looming spectre of carbon trading, increased legislation, increased insurance premiums and have weighed up the benefits and risks and then decided to go carbon neutral.

Another consideration for organisations contemplating neutrality, is the boundaries for measurement. How far should companies look when calculating their footprint? How far along the supply and distribution chain should a company measure? For many companies this decision becomes an issue of credibility and demonstrates rigorous commitment but also becomes an issue of company ethics and responsibility.

To offset or not to offset–that is the question

However, going carbon neutral is not to be embarked upon lightly. There are many risks involved and the added costs of offsetting can run into the thousands and millions depending on the size and type of the business. On the flip-side, going carbon neutral allows a company to future-proof itself from potential risk. It also allows an organisation to do so at its own speed rather than driven by the timetable of legislation or onset of carbon trading markets.

For some industries however, especially extractive industries and energy companies, neutrality is not an option– which leaves offsets.

Offset or greenwash

Offsetting by itself is attracting consumer concern, and rightly so. When websites like www.cheatneutral.com start popping up you know that there is a general level of concern over reputable and reliable offsets. There is a healthy level of suspicion over which offsets actually contribute to reducing emission output or sequester carbon from the atmosphere.

Simply put, if companies do not use reputable and reliable offsets that are independently verified they run the risk of consumer backlash.

The offset industry is said to be worth USD$350 million. But without proper controls there is the risk of double-counting of carbon credits. Secondly you have to ask yourself whether a company is using offsets to make you feel good about consuming something without taking any steps to achieve real change or alleviate environmental concern.

Smart Money

Apart from the obvious savings that an energy and operational efficiency program provide, the business case for a company aiming for carbon neutrality is clear. Increased consumer awareness and employee recognition that the company they work for is a responsible and reputable business provide their own benefits.

Add to this that carbon trading will be upon us sooner rather than later, it is prudent to get ahead of the rush as more and more companies bring in a limited number of energy efficiency consultants to re-engineer their business. There is also an extraordinary marketing advantage in being a leader rather than a "me-too" business.

The business case for identifying and measuring carbon, actively reducing emissions with decreasing targets over time and offsetting the remaining residual emissions can be measured in monetary terms, but also in reputation and consumer loyalty. In the end, there are few businesses that can't afford to start on the path of carbon emission reduction, energy efficiency and ultimately carbon neutrality.

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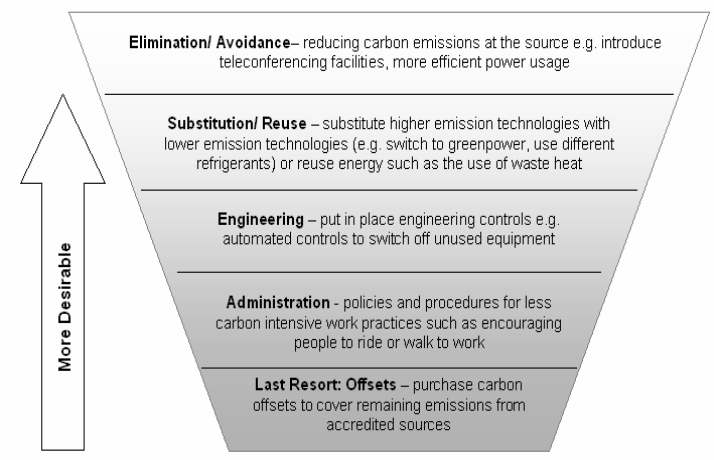
CORPORATE MORALITY & THE CARBON HIERARCHY

Anita Mitchell – WSN Environmental Services

As company boards sit down to work out what to do about climate change, what they find is not so much of a technical issue, but one of a moral or ethical nature. There is an emerging market in cheaper carbon credits and company boards are faced with the dilemma of claiming quick carbon neutrality through cheaper offsets, or face the longer road in restructuring their business to reduce their overall carbon footprint.

Which is better: Early action without reviewing your complete carbon emissions, or a more fundamental review of your business before making offset purchases? In the end, this decision lies with the Board.

To make it easier, some have been talking about a carbon hierarchy, which is a nice parallel with the waste hierarchy or the safety hierarchy, namely:



Obviously the idea is to focus attention on controls higher up the hierarchy. Once this is done, we then get into the real moral mine field of carbon offsets, which ones are best? The best offsets are obviously accredited ones, ensuring an auditable trail to prove authenticity.

Many green groups are also criticising tree planting based offsets as they claim future carbon sequestration benefits today for the total life of the tree and they are less reliable (subject to disease, drought and fire problems). The problem is that there is a price premium on "deep green" versus "light green" credits- deeper green generally being sourced from higher up in the hierarchy eg renewable energies and lighter green being lower down the hierarchy eg carbon sinks. Which ones do you purchase? Do you take the moral high ground and hope that you will be rewarded, or will your stakeholders really be well versed enough to know the difference?

Green power for example is expensive, for the price of switching over to renewable energy, most companies could easily buy enough cheap credits to claim quick carbon neutrality. Which should you choose?

Ultimately it is up to every Board and management team to work out their carbon footprint and to focus in on where the big gains can be made. Aside from focussing in on what matters, companies then need to put in plans to work on controls higher up the hierarchy. It is helpful to remember that while buying offsets is a good thing, it is really riding on someone else's coat tails and doesn't bring the cultural change nor the deep cuts that are required. It really should be the option of last resort.

Anita Mitchell is the General Manager, Sustainability & Assurance WSN and President of the EIANZ (NSW Division)

WHAT MAKES A GOOD CARBON OFFSET?

By Murray Hogarth – Ecos Corporation

You've seen the light on climate change. You want to act in your business. 'Go carbon neutral' is the mantra you're hearing. To do this anytime soon you'll need some 'carbon offsets'. But what makes a good offset? And is carbon-offsetting what you should do anyway?

Taking the last question first, buying CO_2 pollution savings made by others as 'offsets' for your own pollution is the third thing you should do. The first is to start reducing any pollution going into the atmosphere directly from your operations. The second is to get going on cost-effective, on-site renewable or low-emission energy generation and energy efficiency measures to stop pollution back at your local power station, which most likely will burn coal.

That said, don't be so purist about this hierarchy of action that you end up not acting at all. In the early years taking action, including via offsets, deals your business into the emerging carbon market; and you'll need the experience as standards, community and regulatory pressure to cut CO_2, and also trading opportunities escalate.

Offsetting to get started on the challenging road to carbon neutral, or even the holy grail of 'carbon positive', can make sense not just for your business but for society more broadly. Given how long-lasting greenhouse gases accumulate in the atmosphere, every tonne of CO_2 cut now is worth more than one cut in 10 or 20 years' time. Every offset dollar channelled into solution technologies and behaviour programs now gets us closer to lasting solutions.

Choose the right offsets and you can be doing more than acting on climate change, important as that is in its own right, with the potential for a range of other environmental, social and economic benefits. A simple example is water-saving showerheads, which save energy by reducing water heating, but save precious water too. Choose the wrong offsets and you're likely to waste your money, damage your credibility and do little or no good for anyone!

Choice is there aplenty in the suddenly burgeoning market place for carbon offset products, so making the right choice can be a challenge. Banks, insurance companies, travel companies, airlines, energy utilities and a host of specialist players are among those trying to sell offsets, and the growing variety of products, as well as the proliferation of sources, is confusing.

There's relatively cheap offsets from flaring gas from oil wells in the Gulf of Mexico, which turns high-polluting methane into less-polluting but still bad CO_2, with prices as low as $4-5 a tonne of CO_2-equivalent. There's relatively expensive new wind energy from 100% Pure New Zealand at near $30 a tonne. There's also lots in between on the cost curve, including offsets created through driving household and business energy efficiency, various kinds of tree-planting, and bush land conservation and 'avoided land-clearing'.

Like many products and services we buy, some carbon comes with a great brand and heart-warming 'product story' attached, and some, like gas-flaring, are just brutally functional. Which raises another question: is every tonne of pollution kept out of the atmosphere the same, or are some tonnes inherently better than others?

Back then to the key question: what makes a good offset? It should:

1. Stop CO_2 pollution straight away. Renewable energy, energy efficiency and even some 'avoided land clearing' (one product in Queensland is carbon saved from entering the atmosphere by farmers agreeing not to bulldoze bush land that was already licensed to clear) meet this objective.
   Tree-planting, with its long timeframe for trees to grow, and its inherent dangers from fire, drought and pests, does not. Gas-flaring stops methane, but still allows CO_2.
2. Be backed up by an accredited methodology, with scientific validation where appropriate. In Australia, a non-Kyoto Protocol country, this means products like NSW Greenhouse Abatement Certificates (NGACs), Renewable Energy Certificates (RECs) and Australian Greenhouse Office Greenhouse Friendly accredited offsets.
3. Wherever possible deliver other, additional environmental/social/economic benefits as well as cutting CO_2. For example, promoting household energy efficiency can encourage follow-up action as householders become more aware, and stopping land-clearing protects biodiversity as well as CO_2 pollution.

As you look for the offsets that work best for your business, perhaps with a local angle that enhances your business profile in your key areas of operation, it is worth remembering this is a young and evolving market. A bit of trial and error is justified to find what's right for your needs. You also may need time to get comfortable with the whole concept of paying hard-earned dollars for an invisible gas you're told is being stopped from going up somewhere in the Earth's vast atmosphere.

On a personal note, until recently I was totally uncertain about carbon offset offerings on the Internet. Could I trust them? Were they effective? When I wanted to offset family travel and our daily lives, I came up with an alternative concept of a 'moral offset', doubling the carbon calculator value of the pollution I needed to offset and donating the money to a green group I believed would campaign effectively on climate change.

I don't commend this strategy to business, but I do recommend taking time to understand and get comfortable with offsets and with the carbon story in your own business.

*Murray Hogarth is group strategy director with Ecos Corporation and author of *The 3rd Degree: Frontline in Australia's Climate War* (www.plutoaustralia.com, April 2007)

SOMETHING FOR EVERYONE

Anna Reynolds, - WWF International

One reason for the constructive nature of the recent IPCC talks in Bangkok is that the Working Group's final report has something for everyone – if you are a delegate of the Indian Government keen on coal, the report makes room for it. If you are the delegate from Brazil with its strong biomass industry, the report also gives this solution a boost.

The IPCC Working Group did not really pass judgment on the best technologies for tackling climate change. It did however make it very clear that tackling climate change needs to be done right now and the efforts we make over the next two to three decades in reducing greenhouse pollution will determine the long-term temperature increase that future generations have to live with.

The IPCC have now made it crystal clear that global greenhouse gas emissions need to be at their peak level within 15 years and be reducing every year after that to be at 50% of the current levels by 2050. This is our global challenge, which means that we in Australia need to make room within this carbon budget for growth in emissions in emerging economies where many people do not have access any electricity.

For me this means I reduce my emissions as much as I can – I don't own a car, I buy Green Power and limit unnecessary consumerist urges! Then I also buy carbon offsets to neutralize the things I like that there are less alternatives for. For business, this must also be the approach – carbon offsets are the cream on the cake of a strategy that must involve deep reductions in actual emissions on site, in the line of production and in investment choices.

There is a growing concern around the world about the over-use of the carbon neutral concept, and the danger of flattening informed debate. I'm particularly worried about the use of the concept with products, where "carbon neutrality" can simply act as a leveller to remove any differentiation and legitimise poorly performing goods. Imagine a hardware store offering "carbon neutral" incandescent lightbulbs alongside "carbon neutral" compact fluorescent lightbulbs. Which is the better product?

As the advice becomes clearer on what we need to do, we need to ensure our actions have a genuine impact rather than a marginal one. We need to stem the big trends that make it difficult for carbon offsetting efforts to keep up – like the fact that in the last 4 years coal use around the world grew by 22%. In this context our first priority is to actually reduce our use of coal-fired electricity.

We know that carbon offsets are a useful tool but we know its only part of the picture. For WWF it is essential we continue to advocate for both the major policy actions to reduce the need for polluting technologies, as well as ensuring that through quality control on the standards and methodologies that are used by carbon offset products, the carbon neutral market is having a useful impact in meeting our big challenge.

www.panda.org/climate

Anna Reynolds attended the Bangkok meeting of Working Group 3 of the IPCC as a delegate of the WWF International.

ACHIEVING REPUTABLE VOLUNTARY CARBON OFFSETS

Martijn Wilder, Partner and Liz Day, Associate Baker & McKenzie

With more companies looking to improve their 'green credentials' and look at becoming 'carbon neutral', or offsetting a part of their emissions, as evidenced by the recent announcement by News Corp, the market for voluntary carbon offsets has been steadily growing. In fact, offsets are measured, voluntary greenhouse emission reductions or abatements by one party that have been purchased by a company or individual to counterbalance their emissions.

However recent scrutiny of the use of offsets to reduce another company's own emissions, including leading articles in the Financial Times, have highlighted the importance of understanding the nature of voluntary offsets and how to ensure the any offsets they buy are legitimate and carry no reputational risk.

Unlike the Kyoto and EU markets, the voluntary market is unregulated with no legally binding standards. This creates the potential for fraud and double-counting of offsets and presents no real longer term means by which the offsets being purchased are monitored. Instances have been reported of companies buying worthless offsets that have already been sold to someone else, have not yielded any reductions in carbon emissions or are not additional to reductions that would have occurred anyway. In this regard, the purchase of carbon offsets may in some cases open a company to criticisms with claims of *greenwashing.*

The first step for any company interested in tackling climate change or improving its environmental standing may be to reduce emissions internally by investing in energy-saving measures and changing behaviour. However, given it is not possible for most companies to completely offset all their emissions through direct actions to reduce emissions, the purchase of carbon offsets will usually be required… The questions then become, what is a genuine and valid offset? What type of offsets do I buy? Are there any types I should not buy and if so why? And how much do I pay?

To assist buyers, and enable a more regulated market, three such standards are currently being developed to help purchase and identify offsets that represent real, measurable, permanent and additional carbon reductions.

A number of voluntary carbon standards are being developed which broadly incorporate the essential criteria for any reputable offset. The three main standards are the Climate Group/International Emissions Trading Association/World Economic Forum Voluntary Carbon Standard (http://theclimategroup.org/assets/Voluntary_Carbon_Standard_Version_2_final.pdf), the Gold Standard, promoted by WWF, SouthSouthNorth and Helio International (http://www.cdmgoldstandard.org/uploads/file/GS-VER_Proj_Dev_manual_final%20.pdf) and the Climate, Community and Biodiversity Project Design Standards (http://www.climate-standards.org/standards/index.html).

These standards are broadly based on the standards used by the regulated market but also incorporate additional sustainability criteria. The Climate, Community & Biodiversity Standards apply to forestry and land-use change projects, the Gold Standard applies only to renewable energy projects and end use energy efficiency improvement projects whereas the Voluntary Carbon Standard admits a greater range of projects (although forestry projects and land-use change projects are currently excluded). The issues of additionality, leakage, measurement, monitoring and permanence are addressed and the standards provide for a process of independent verification with varying levels of monitoring, validation, registration, verification and credit issuance procedures.

Key criteria being utilised by such standards mandate that the carbon emission reductions are:

- Additional;
- Real;
- Not double-counted;
- Independently Verified;
- Measurable;
- Permanent;
- Transparent; and
- Assignable.

The carbon offset standard should promote projects with positive environmental and/or development benefits and there should be criteria in place to ensure that the projects do not have any negative environmental effects.

So how can a company ensure that a carbon offset or project meets the above criteria?

It is important that purchasers of carbon offsets conduct proper due diligence on the offset brokers and the projects they invest in. Key issues to consider include the broker's reputation and experience plus the broker's ability not only to run a project but also to account for its impacts.

In conclusion, companies need to be diligent in ensuring that any offsets purchased are sound and preferably verified in accordance with one of the emerging VER standards to protect against any potential reputational backlashes. Companies also need to be aware that there remains opposition to certain types of offsets such as forestry that also need to be managed. However, at the same time companies should embrace the opportunities that investing in genuine carbon offset projects present to contribute to reducing global emissions.

BIOCHAR AND THE NATURAL CARBON CYCLE

Matthew Warnken, Crucible Carbon Consulting

The natural carbon cycle refers to the movement of carbon from the biosphere (living things) to the abiotic or 'non-living' sphere comprising minerals, molecules and elements within the lithosphere (Earth's crust), hydrosphere (water) and atmosphere; and then back again to the biosphere. Carbon enters the biosphere primarily through the action of photosynthesis in plants and algae, which use the energy of light to convert carbon dioxide (CO_2) into organic matter, such as simple carbohydrates like cellulose.

Carbon exits the biosphere through four main mechanisms: respiration by plants and animals; burning (oxidation of carbon into (CO_2); decay (into CO_2 if oxygen is present and methane (CH_4) if there is no oxygen); and sedimentation and fossilisation – conversion of living organisms into coal, gas, oil and in some cases limestone (from coral and sea animal shells).

The primary cause of global warming is the increased concentration of CO_2 in the atmosphere caused by the liberation of fossilised carbon through burning fossil fuels such as coal, oil and gas. The release of carbon into the atmosphere has been at a greater rate than Earth's capacity to absorb and sequester carbon dioxide. Some sequestration processes include: new biomass growth (plants and algae); dissolving CO_2 in water to form bicarbonate (HCO_3); formation of carbonate structures (coral and shells are composed of calcium carbonate ($CaCO_3$)); 'fossilisation' of carbon into coal, oil and gas; and formation of methane hydrates (carbon in methane trapped in ice lattice structure formed in certain low temperature and high pressure conditions).

Part of the climate change challenge, in addition to reducing greenhouse gas emissions, is arguably to augment the natural carbon cycle by removing atmospheric carbon and safely storing it in sinks. This is the logic behind 'geosequestration', or the removal of carbon dioxide (usually from a power station's off gases), compression and storage in geological deposits. Leaving aside the potential risks of CO_2 escaping with potentially fatal results, the best that geosequestration can offer is a disposal service for CO_2 that makes no attempt to convert the carbon into a useful product.

A more sustainable solution is the process of manufacturing 'biochar', an opportunity recently promoted by Australian of the Year, Tim Flannery who believes that biochar has real potential to take carbon out of the atmosphere and store it safely through land application.

Biochar is charcoal that has been manufactured by processing biomass through a pyrolysis process (heating in the absence of oxygen). Pyrolysis releases volatile elements in biomass to form energy rich gases and liquids, and leaves behind a very stable form of carbon – biochar.

The longevity of biochar has been established by studies into the practices of Amazonian Indians and their 'slash and char' agricultural practices. The resulting so called 'Terra Preta' soils (black earth) are still identifiable some two thousand years later, with a much higher carbon content than surrounding plots of land (in some cases up to 18 times the carbon content as in surrounding soil).

While the science of biochar is still developing, the first order Terra Preta evidence suggests that biochar will have a half-life measured in the hundreds if not thousands of years. More importantly, this carbon storage effect of biochar, (where carbon is removed from the atmosphere through photosynthesis of biomass and stabilised through pyrolysis), is a byproduct of the main application of biochar use as an agricultural supplement. Indications are that biochar will: increase nutrient retention; increase water retention; decrease run-off; improve soil structure; increase crop growth rates; reduce fertiliser use (with accompanying reductions in fossil fuels used to make fertiliser); and decrease nitrous dioxide emissions from agricultural crops.

Australia is leading the early stages of biochar commercialisation, which offers significant to reduce greenhouse gas emissions from the agricultural sector, in addition to generating renewable energy as part of the pyrolysis process. Biochar also has the potential to be a significant global wedge of carbon abatement, by replicating the natural carbon cycle and safely stabilising biogenic carbon into a form of carbon with a long half life.

Matthew Warnken is a Principal of Crucible Carbon Consulting, a consulting company that combines sustainability thinking, life cycle technical analysis and business strategy to help companies go 'carbon neutral or better'.

CARBON NEUTRALITY: THE NEW GREY

Jeff Smith, NSW Environmental Defenders Office

Climate change has arrived with a late flourish in the Australian political landscape. Carbon neutrality has quickly become the recognised institutional means of dealing with the problem, at least from the perspective of industry. In turn, businesses have popped up purporting to advise on carbon neutrality, and/or offering to assist industry and others to achieve it.

These developments, whilst in many respects welcome, have not been without their problems. If green is the new black, carbon neutrality is the new grey.

Carbon neutrality is problematic largely because it is evolving in a regulatory vacuum. Voluntarism has a poor track record in driving change at a corporate level: the institutional barriers are just too strong. In the absence of strong government leadership on the issues, business – even with the strongest will in the world – is unlikely to set the bar too high.

What problems, then, do flow from voluntarism?

First, robust practices are ultimately dragged down by the weak. As one might expect, voluntarism allows for considerable diversity regarding what actions or schemes can lay claims to carbon neutrality. Tree planting - widely seen by analysts as the weak end of the spectrum – can jockey alongside so-called "avoided deforestation schemes" (where permits to log are purchased and not used) or renewable energy projects. Renewable energy projects can, in themselves, be of vastly different hues – wind, solar, biomass, hydroelectric - with some being accredited and others not. As there is no arbiter of these things, all claims are (relatively) equal and difficult to distinguish in the marketplace of ideas.

Second, and relatedly, legitimate players tend to be tarnished by the illegitimate. Participants can "opt in" to an accreditation scheme - through funding only certain projects or actions - but accreditation is not a prerequisite to play in the carbon neutrality market. In the absence of agreed rules and principles, space is created for shysters, which has industry-wide implications.

Third, voluntary schemes generally fail to correct behaviour, allowing for the continuation of a "business (and consumption) as usual" approach. Offsetting measures are often not set into a framework of emission reduction targets, or underpinned by energy efficiency and renewable energy initiatives. Satirical sites such as http://www.cheatneutral.com/ lampoon this approach by allowing you to fund others to not cheat on their partner. The message is clear: offsetting (without more) is a salve for the conscience above all else.

Fourth, voluntarism engenders an inconsistency of approach and outcomes. For example, the main Commonwealth scheme in Australia is voluntary but more robust, while the primary NSW scheme imposes mandatory standards but is substantially flawed in practice.

Fifth, voluntarism and accountability are uneasy bedfellows. There is no way of centrally tracking whether carbon credits have been put away and "retired", so double counting – deliberate or otherwise – can occur. Likewise, companies seeking to do the right thing have to spend considerable time and resources testing the bona fides of those who broker carbon neutral services or establishing self-regulatory schemes.

Sixth, fraud is more likely to flourish under voluntarism. Claims of carbon neutrality are notoriously difficult to check, but particularly so when "buyer beware" is the prevailing philosophy in an unregulated market.

In short, voluntarism is not in the interests of the community, government or industry - it ultimately only favours the cowboys.

It is likely then that we will travel down the age-old policy path:

Voluntarism – failure – call for regulation - regulation

So what would a well designed scheme look like? In a very real sense, of course, this is a paper in itself. But equally so it must be said that the problems in this area arise more from a lack of political will than the absence of policy prescriptions.

In this respect, then, I will answer this question backwards. A robust scheme will be one that ensures that offsets possess the following attributes:

- enduring
- quantifiable
- targeted
- additional
- enforceable

If these attributes are present, we will have gone a long way to ensuring that carbon neutrality schemes result in net improvements to the environment, rather than financial windfalls for cowboys.

Jeff Smith is the Director at the NSW Environmental Defenders Office and a longtime member of the management committee of the Total Environment Centre

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BURNING ISSUES – IS EMISSIONS TRADING A GOOD DEAL FOR AUSTRALIA?

Rupert Posner, The Climate Group

Climate change is the issue of the day. With impacts including rising sea levels, more extreme weather events, water shortages and millions of refugees, it's more than just an environmental crisis. Climate change is a burning political and economic issue, with global business frequently cast as fanning the fire.

Over recent years, as a scientific consensus has emerged climate change has become a boardroom and public issue. Of course some have buried their heads in the sand, but there are many companies and ndividuals who are leading the way on cutting energy use and developing low carbon products and services. For business, this has often meant discovering new opportunities as a result.

Two things that both business and individuals are asking to learn about and take up are emissions trading and the voluntary offsetting of their greenhouse gas emissions. These are part of a relatively new breed of 'market based' environmental policy instruments aimed at reducing emissions as quickly and cost-effectively as possible.

The concept of emissions trading is simple. Emitters of greenhouse gases are given an allocation of allowances (the number of tonnes of greenhouse gases that they are allowed to emit over a particular time period) under oversight bodies such as the Kyoto Protocol. At the end of the period the company must have sufficient allowances to match all its emissions. If a company generates more emissions than the number of allowances it holds, it can invest in reducing its emissions at source or buy allowances from another company that has gone beyond its targets and therefore has allowances to sell.

The economic principle is that by setting a market price for carbon we get emissions reductions at minimum cost. For an emissions trading scheme to actually deliver on its environmental objective and encourage sufficient investment in low carbon technologies, the allocations made to industry must be significantly below business-as-usual levels and set over a timeframe consistent with investment decisions.

In Australia there are some concerns over competitiveness –- that without similar schemes in countries we compete with for trade -- there is no level playing field.

However, it's equally apparent that an increasing number of companies, realising that emissions trading is inevitable, support strong government action. The thinking goes that if companies are going to have to make changes anyway, better that there is a stable framework within which to plan.

But what does this mean for Australian businesses? Firstly, it's worth noting that the European scheme is likely to be extended over time to cover a wider range of sectors and companies investing in Europe need to follow its progress.

And last year, California Governor Arnold Schwarzenegger signed an agreement with UK Prime Minister Tony Blair to explore ways to link their carbon markets. Australian States also have committed to an emissions trading scheme and last week Victorian Premier Steve Bracks signed an MoU with Governor Schwarzenegger to, among other things, examine how to link their respective emissions trading schemes.

While waiting for policy framework to evolve, there is another critical factor to consider. With increasing press coverage, individual awareness is growing and consumers increasingly expect the businesses whose products and services they buy to be taking positive action.

In other words, even for those companies that are not yet covered by legislation or included under any particular trading regime, there are still major opportunities associated with being an early adopter in the voluntary market.

Understanding your emissions profile, reducing those emissions and communicating this effectively is increasingly becoming an opportunity for brand differentiation.

HSBC, Sky TV and News Corp., for example, recently became some of the first companies in their sectors to go carbon neutral (effectively reducing their net carbon emissions to zero). They achieved this not just by improving energy efficiency and buying green power but also by purchasing 'offsets' to compensate for their remaining carbon footprint.

Offsetting is basically the process of purchasing emissions reductions made elsewhere (from a renewable energy project in the developing world, for example), to count against those of your own emissions which are too difficult or expensive to tackle directly. It's an option already available to those participants in the regulated market of the EU-ETS and Kyoto. But the blossoming voluntary market demonstrates the increasing number of companies, and individuals, who want the benefits of flexibility when taking voluntary steps to reduce emissions. And because it is a voluntary market, Australians can participate.

It's critical that trading and offsetting systems have robust, credible frameworks to create the confidence and stability needed to make them work long-term. It is early days for emissions trading, with inevitable hiccups, but over-time a global scheme will evolve. It is likely that ultimately we will have to rely on a wide range of policies, some more flexible than others, to achieve the end-goal of avoiding dangerous climate change and the catastrophic economic losses which that would certainly entail. But one thing is near certain, carbon is now money and more and more of us are going to be counting it.

Since 2005, The Climate Group, the International Emissions Trading Association (IETA) and the World Economic Forum Global Greenhouse Register have been working to develop the Voluntary Carbon Standard (VCS). The VCS is designed to be a global benchmark standard for project-based voluntary emission reductions that provides a degree of standardization to the voluntary carbon market and creates a credible voluntary emission reduction credit, the VCU, that can be trusted, traded and used.

The VCS has now been through a number of revisions in consultation with businesses and experts overseen by an independent Steering Committee and will be released in late 2007. It is hoped that strong international standards such as these will help take some of the mystery out of the voluntary offset options available and to allow the most credible, and therefore effective, to gain market support.

Rupert Posner, is The Climate Group's Australian Director. The Climate Group works to catalyse leadership among governments and companies to address the challenge of climate change and has teamed up with the World Economic Forum and the International Emissions Trading Association to develop a global Voluntary Carbon Standard for trade in emission reductions. www.theclimategroup.org

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The Reality of Carbon Neutrality – Energetics Pty Ltd

WHAT IT MEANS AND HOW TO ACHIEVE IT

In response to a rapid increase in public awareness about global warming in the last 12 months, many corporations are focusing on how they can manage their carbon impacts.

Businesses are doing this for several reasons:

- To establish their public positioning on this issue;
- To undertake practical measures to reduce energy costs leading to reduced emissions and future carbon risk;
- To satisfy their staff, who are increasingly looking to their employers to show they are taking responsible action to reduce emissions.

Many organisations are aiming to define their carbon footprint, to reduce this footprint by reducing the emissions from the business and, increasingly, to reduce their impact further by purchasing 'green energy' (from renewable sources) or carbon offsets. Some companies, wishing to go further, are becoming 'carbon neutral', where they completely offset their carbon footprint to theoretically have zero carbon impact on the environment.

The challenge in Australia for companies, analysts and shareholders is to ensure that there is a common understanding of what it means to be 'carbon neutral', and agreed standards for each of the elements involved in achieving that status. Without this clarity, there will be uncertainty about the validity of 'carbon neutral' status. This will undermine the confidence in the term 'carbon neutral' and the market positioning value for companies that invest to become genuinely 'carbon neutral'.

Furthermore, companies that do not use a rigorous approach could be inadvertently misleading their shareholders and the public, as well as committing to future financial obligations and other risks which they do not fully understand.

The Steps

STEP 1: DEFINE YOUR CARBON FOOTPRINT

Determine by conducting a 'Life-Cycle Assessment' (LCA), to establish the full extent of direct and indirect CO2 emissions caused by your business activities. This is a systematic methodology for calculating the carbon emissions. It includes direct operational emissions from electricity, gas and transport as well as emissions from inputs into the business such as paper, emissions from waste generated, or energy from outsourced activities.

Use acceptable Methodologies/Standards

The standards and guidelines suitable for use by Australian companies include:

- The Greenhouse Gas Protocol published by the World Business Council for Sustainable Development and The World Resources Institute;
- The Australian and International Standard AS ISO 14064; and
- The methodology used by the Australian Greenhouse Office in its Greenhouse Friendly program which is based on the AS ISO 14 040 series of standards.

- Are the emissions material to your inventory?
- Would the emissions occur even if you were not providing your service or product?

Every decision taken to include, and more importantly, exclude, emissions from your footprint, must be justifiable in the public domain and associated emission calculations must be verified by an independent expert auditor. Only then, should you start looking at the types of offsets you can buy to negate your carbon footprint.

Data Collection and Verification

Use accounting systems that track all your business activities (as well as indirect emissions such as air travel and accommodation) that contribute to your carbon footprint.

STEP 2: MINIMISE YOUR CO2-e FOOTPRINT

Energy Efficiency

Increasing energy efficiency will not only reduce direct energy costs, but also reduce the cost of becoming carbon neutral, as with each implemented energy efficiency project, the potential cost of purchasing carbon offsets will also drop. Most companies can achieve energy savings of 10-15% with a consistent energy efficiency program of auditing and benchmarking.

Green Energy

Green or renewable energy does not increase greenhouse gases in the atmosphere. Organisations can either:

- Install renewable power generation on site; or
- Purchase GreenPowerTM.

STEP 3: OFFSET YOUR CARBON FOOTPRINT

Carbon offsets vary in price and quality. It is crucial to the credibility of a carbon reduction claim that the buyer ensures that the money is being spent on 'legitimate' greenhouse abatement activities in other words, only those offsets which have a high level of transparency and verifiable contribution to the reduction of greenhouse gases. They should:

- Be easy to communicate and clearly explained to stakeholders;
- Demonstrate an environmental benefit in terms of an actual emission reduction (environmental additionality);
- Have a certainty of delivery (regardless of impacts of weather and natural disasters);
- Be flexible enough to accommodate your changing business needs in the supply of offsets;
- Adapt to future policy and market environments (e.g. the offset will continue to exist in a national emissions trading scheme); and
- Be co-beneficial – existence of benefits beyond the primary outcome of greenhouse gas abatement such as social and economic benefits to a local community.

CORPORATE REPUTATION AND FINANCIAL RISKS

Carbon neutrality, based on a less rigorous approach than the one outlined above, represents a real reputation risk for Boards and Executives and can result in accusations of "green wash".

Australian companies should pay heed to hard-learnt reputation lessons, such as that of Nike in the USA (Kasky vs. Nike case). They should be mindful that representations they make in the public domain are not misleading about the extent of their carbon neutrality, both at a company and product level.

If ever there was a business case for an agreed framework or guideline for reporting on carbon neutrality, so that consumers, analysts and investors can determine with absolute clarity the genuine aspiration from green wash – this is it.

In the absence of an agreed framework in Australia – how can a company's customers, analysts or investors tell the difference between company A and company B? Under the European Union Emissions Trading Scheme there is an accounting protocol that requires this cost to be disclosed in financial statements in a very particular way. This makes it a level playing field and transparent.

COST OF 'GOING CARBON NEUTRAL'

Undertaking the carbon neutral process is not a trivial one, and the use of a government-approved framework such as Greenhouse Friendly is not a cheap exercise, costing upwards of $40,000 for the assessment alone (not including the cost of abatement credits). But if a company wants to legitimately claim carbon neutrality, and reduce the risk of being accused of green wash, then it is money well spent.

Any compromise on the quality of the footprint calculation is just too risky for those who value their brand and reputation.

Written by Mary Stewart – Principal Consultant, Mining, Cheryl Bowler - Principal Consultant, Carbon Markets, Jonathan Jutsen the Executive Director and Linda Funnell-Milner the National Director, Sustainability at Energetics Pty Ltd.

To read Energetics' full paper 'The Reality of Carbon Neutrality', please visit: www.energetics.com.au/services/services/carbon_neutral.

IS 16% EMISSION REDUCTION 'CARBON NEUTRAL'?

Tony Mohr– Australian Conservation Foundation

Nine in ten Australians want government action to reduce greenhouse gas emissions. Two in three say political parties' climate change policies will influence their vote in the upcoming federal election. And companies are falling over themselves in the rush to tap into the urge Australians have to actually do something about climate change.

So in my more optimistic moments I imagine what would happen if all those concerned citizens went carbon neutral. Sadly, the results make me look more like a pessimist. If every man, woman and child offset all their flights, vehicle emissions and electricity emissions, Australia's emissions would fall by around 16%. That's a damn sight better than what's on offer from either the Federal Coalition or Labor, but it's clearly not 'carbon neutral'. Most people would be surprised that such a big commitment on their part only takes a chip off the climate change boulder.

What causes the other 84% of emissions? The answer to this riddle lies in the supply and manufacture of the goods and services that underpin our daily activities. Offsetting does not account for the emissions that are 'embodied' in the goods and services we consume and use every day. Sydney University has crunched the numbers, tracing the greenhouse gas emissions across supply chains. The research found, for example, that every dollar spent on lollies creates 0.5kg of greenhouse gas emissions.

Now I can already hear the chorus of voices saying 'but this is where carbon neutral businesses save the day! We just need every mum, dad and business in Australia to go carbon neutral'. Now that really is being optimistic. Businesses going carbon neutral tend to fall into two categories: small businesses owned by committed individuals doing their bit at home and at work, and financial services companies with very small direct carbon footprints and very large reputations to protect. There are no signs of the first carbon neutral aluminium smelter or cement factory.

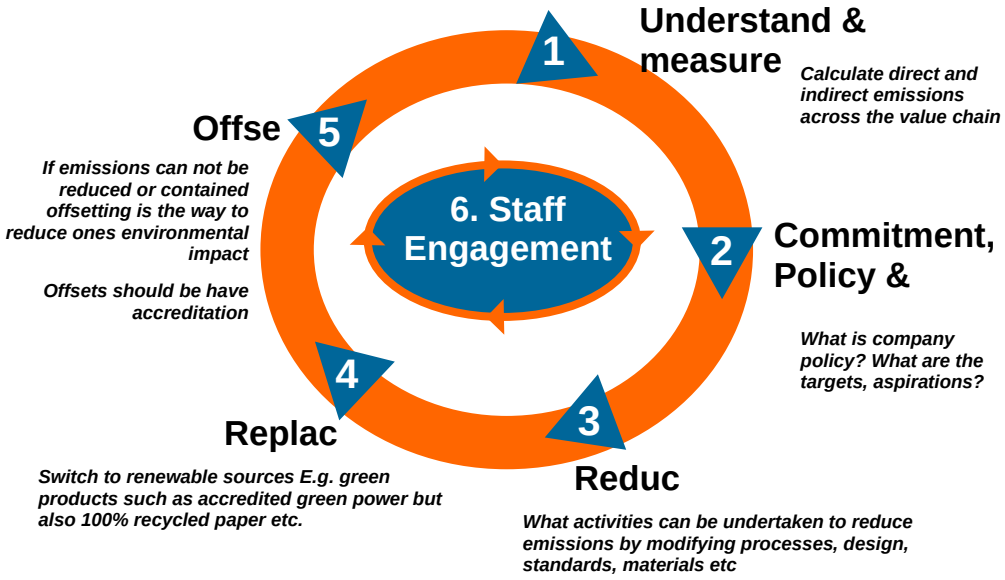
Let's face up to the truth – going carbon neutral will not be enough to save the climate. For that Australia needs to slash its emissions by 80% by 2050 just to have a lower risk of dangerous climate change than of having your house burgled. (yes, I can back up that statement with science).

Getting back to my optimistic self, there are benefits to going carbon neutral other than direct emission reductions. The biggest is political. The demand for carbon neutral products is better than any opinion polling measuring public concern about global warming. To say you want action on climate is one thing. To voluntarily hand over money in order to get it is another thing entirely.

Politicians not totally convinced by their polling should be convinced by the carbon neutral trend. And as more companies take voluntary action, it becomes so much easier to make more recalcitrant businesses get active via regulation. The carbon neutral carrot creates the political space to introduce a little stick. Uptake of voluntary offset programs just might help tip the balance towards getting a decent emissions trading scheme when the PM's taskforce reports back at the end of May.

Philosophy and the climate responsible company
Origin Energy – Marc van Beek & Madeleine Lyons

Reducing your company's carbon footprint is a very positive thing for a company to undertake and to communicate your sustainability commitments to your stakeholders. However, we believe this should be done in way that the behaviours and operations of a business are continuously challenged. It's important to look at novel ways to capture emission reduction opportunities as they present themselves. An effective greenhouse mitigation strategy should incorporate the approach outlined in the climate wheel below:



While you can start with number one and work your way through sequentially, sometimes this isn't always appropriate. The good thing is that wherever you start on the wheel you're beginning to internalise your climate costs, which in turn will drive internal behaviour towards further positive climate action.

Why we set up the Carbon Reduction Scheme (CRS)

There is growing interest amongst Australian industry to cut emissions and even go carbon neutral. This is evidenced with the recent announcements by IAG, NAB and ANZ, to name a few. This is a great act of leadership, however figuring out how to reduce your carbon footprint in a credible way that really cuts emissions can be a time consuming challenge.

Carbon is an exciting new international commodity whose trade already generates billions of dollars. However the market is still immature. In a voluntary market where no two offsets are alike and where prices vary greatly, Origin has developed the CRS with the aim to create a standard that gives companies confidence to participate in the voluntary carbon market. The CRS is developed around five principles: credibility, transparency, affordability, flexibility and effectiveness.

Origin Energy launched the CRS in March this year together with our partners NAB, IAG, Lend Lease, AFL, Intrepid, Transurban and STA Travel.

Opportunities to work together are on the carbon supply and demand side by

- Offsetting direct emissions
- Creating carbon supply and monetising customers reductions
- Product development
    - Origin assists in developing carbon offset products
- Extending reach and impact of reduction opportunities
    - Products and services for our partners and staff

Case Study: AFL

The AFL

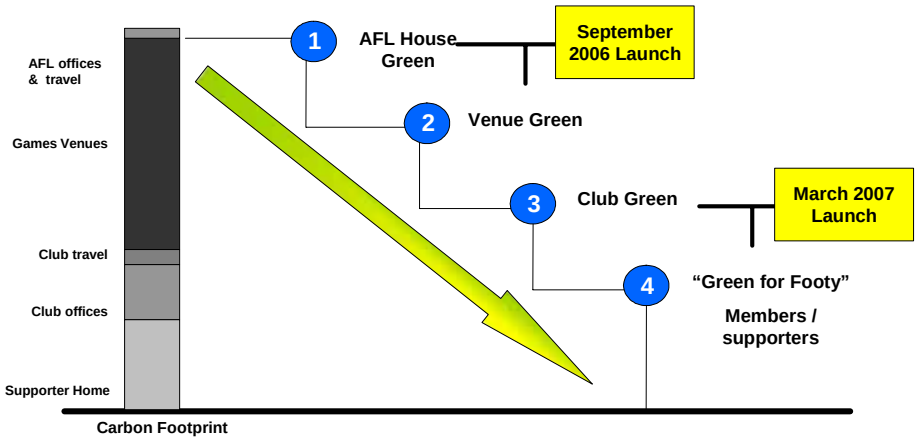
The Australian Football League and Origin Energy launched the AFL Green program in September 2006. AFL Green will neutralise an estimated 120,000 tonnes of greenhouse emissions generated from AFL House, the NAB Cup, Toyota Premiership Season and Finals Series matches over the next three years.

By 2009 the AFL will be 'carbon neutral', with the level of greenhouse gases that AFL head office, clubs and venues collectively emit by energy use on the footy ground, in offices and club rooms, plus emissions from staff road and air travel has been identified and offset by activities such investment in renewable energy and energy efficiency. It will be the equivalent of taking 25,000 cars off the road or planting 500,000 trees.

The program also provides an opportunity for the AFL and Origin to continue their solid partnership which will benefit supporters, clubs, the game and most importantly the environment. By purchasing the Green for Footy product from Origin, footy fans can help the AFL to reach its goal, as well as doing their bit for the environment by making their home energy completely green in the simplest way.

When footy fans choose Origin 'Green for Footy' they switch their home to Origin's Green Gas and Green Electricity products reducing their home energy's impact on our environment. Customers are also rewarded with a Green for Footy pack which includes six energy efficient light globes, a low-flow shower head, a mini green Sherrin® football, drink bottle and green bag.

The four stages of the AFL Green model:



…….. AFL Green is achieved via a set of programs over an extended period