

# Options for Generating Carbon Units from the Management of Nelson City's Parks and Reserves: Part A





# Options for Generating Carbon Units from the Management of Nelson City's Parks and Reserves: Part A

Ian Challenger  
Sean Weaver\*

Prepared for  
Nelson City Council

Cawthron Institute  
98 Halifax Street East, Private Bag 2  
Nelson, New Zealand  
Ph. +64 3 548 2319  
Fax. + 64 3 546 9464  
[www.cawthron.org.nz](http://www.cawthron.org.nz)

\*Principal, Carbon Partnership Ltd,  
81 Severn St Island Bay, Wellington,  
Ph +64 4 383 6898 [www.carbon-partnership.com](http://www.carbon-partnership.com)

Reviewed by:

J A Sinner

Approved for release by:

J A Sinner

Recommended citation:

Challenger, I 2009. Options for Generating Carbon Units from the Management of Nelson City's Parks and Reserves: Part A.  
Prepared for Nelson City Council. Cawthron Report No. 1716. 14 p.



---

## EXECUTIVE SUMMARY

Without action to reduce greenhouse gas emissions sea levels could rise as much as 1.9 metres, inundating part of Nelson and significantly changing the environment (Goodwin 2009). To avoid this fate, global greenhouse gas emissions must peak no later than 2020 and decline to 50% of 1990 levels by 2050 (Ward 2008a).

Set against this background the international community responded with a high level policy instruments to reduce emissions, the Kyoto Protocol, with some country also introducing Emissions Trading Schemes (ETS). In addition a growing number of individuals and firms still have a desire to reduce their emissions and are happy to demonstrate this desire by attaining carbon neutral status.

In Nelson some firms have contacted the Nelson City Council with a view to planting trees on council reserves to enable them to offset their emissions.

This presents an opportunity for Nelson City Council, with the council potentially able to generate carbon units that can be sold to emission reduction aspirants. This report is the first part of two reports that examines existing carbon reduction instruments (both compliance and voluntary based) and the legitimacy of applying these to Nelson's parks. Part two will consider how the management of NCC's parks and reserves can benefit from utilising these instruments.

### Carbon reduction instruments

There are five potential mechanisms Nelson City may be able to use, three of which operate under the umbrella of existing legislation and two of which are voluntary. These five mechanisms are as follows:

1. Compliance based measures
  - a. The forestry sector of the NZ ETS with owners of post-1989 forests able to opt in and gain carbon credits for their forests (but also take on carbon liabilities).
  - b. The Permanent Forest Sinks Initiative (PFSI), which enables landowners to gain Kyoto compliant carbon credits by establishing new permanent forest (Ministry of Agriculture and Forestry 2009a). The Afforestation Grant Scheme (AGS), a contestable fund to enable landowners to be paid to reforest land that had previously been forested. The disadvantage however is that government keeps the carbon credits (and liabilities) not the landowner (Ministry of Agriculture and Forestry 2009b).
  - c. EBEX21, similar to PFSI above but run by Landcare Research, this allows landowners to gain compliance grade carbon credits for allowing the natural regeneration of partially forested land and includes a biodiversity component.
2. Voluntary based instruments
  - a. The international voluntary carbon market that focuses on activities that lie outside the Kyoto Protocol accounting regime (e.g. soil carbon management, and carbon management of pre-1990 forests). This includes a variety of different voluntary carbon market standards.

- b. The proposed Tasman Voluntary Carbon Standard - a domestic carbon trading instrument focusing on activities that are covered by the Kyoto Protocol carbon accounting regime (and the NZ ETS), but enabling participation among a much wider section of society than is possible under the ETS. This proposed instrument is likely to include the same sectors covered by the international voluntary carbon market but aims to provide options that have lower project development and transaction costs.

# TABLE OF CONTENTS

EXECUTIVE SUMMARY .....	III
1. INTRODUCTION .....	1
2. BACKGROUND .....	1
2.1. International compliance arrangements .....	1
2.2. New Zealand's policy framework.....	2
2.3. Voluntary offsetting and carbon neutrality aspirations .....	3
2.4. The response in Nelson.....	4
3. CARBON REDUCTION INSTRUMENTS.....	5
3.1. Kyoto compliant instruments .....	6
3.1.1. <i>Forestry in the emissions trading scheme</i> .....	6
3.1.2. <i>Permanent forest sink initiative and afforestation grant scheme</i> .....	7
3.1.3. <i>Emissions biodiversity exchange in the 21<sup>st</sup> century</i> .....	8
3.2. Voluntary mechanisms .....	9
3.2.1. <i>International voluntary carbon market</i> .....	9
3.2.2. <i>Proposed tasman voluntary carbon instrument</i> .....	10
4. THE CO-BENEFITS OF CARBON CREDITS .....	11
5. CONCLUSION .....	12
6. REFERENCES .....	14





## 1. INTRODUCTION

Greenhouse gases are important in protecting the Earth from the extreme cold of space and with no atmospheric carbon dioxide CO<sub>2</sub>, the average temperature of the earth would be -20°C (Flannery 2005). These gases have been in equilibrium for millennium but since the start of the industrial revolution have increased, with carbon dioxide concentrations increasing from 280 part per million (ppm) to 385 ppm in November 2009, largely as a result of human activity such as burning fossil fuels and deforestation (Stern 2006).

As a result of this increase the climate of Nelson, is changing with an expected rise in air temperature, increase in both rainfall and the frequency and severity of extreme weather events. Sea level could rise as much as 1.9 metres, inundating part of Nelson (Goodwin 2009).

To avoid this, action is needed and global emissions must peak in 2020 and then decline to 50% of 1990 levels by 2050 (Ward 2008a). This level of reductions will not be easy and requires action from governments, businesses and individuals.

The need to reduce emissions presents an opportunity for Nelson City Council. Trees act as carbon sinks, absorbing carbon from the atmosphere and with council owning a large number of reserves and planting trees throughout the city, the council could potentially generate carbon units that can be sold to emission reduction aspirants.

This report is the first of two reports that consider whether Nelson City Council NCC can generate tradable voluntary action credits from its parks and reserves. Part one examines existing carbon reduction instruments (both compliance and voluntary based) and the legitimacy of applying these to Nelson's parks and reserves. While part two (anticipated in February 2010) will consider how the management of NCC's parks and reserves can benefit from utilising these instruments.

## 2. BACKGROUND

### 2.1. International compliance arrangements

In January 2008, the first commitment period of the Kyoto Protocol came into effect with the aim of developed countries reducing their collective global emissions by 5.2% below 1990 levels by 2012 (UNFCCC. 2009). A cap of 58 billion tonnes of carbon dioxide equivalent<sup>1</sup> (CO<sub>2</sub>-e) was set and the combined emissions of the developed countries that ratified the treaty cannot exceed this cap.

---

<sup>1</sup> 'Carbon dioxide equivalent' is the conversion of the global warming potential of other greenhouse gases to a value equivalent to the global warming potential of carbon dioxide. It allows non-CO<sub>2</sub> greenhouse gases to be incorporated into emissions trading as a single 'currency' – hence 'carbon markets' also trade methane, and nitrous oxide emission reductions.

Each developed country that ratified the Kyoto Protocol has a fixed binding target of allowable emissions and is issued with emission ‘allowances’ by the UN (called assigned amount units or AAUs) that represent their Kyoto target.

The emissions trading mechanism of the Kyoto Protocol enables countries to overshoot their target and still be in compliance with the Protocol. To achieve this, at the end of the first commitment period each country must have enough Kyoto compliance carbon units to match their actual emissions between 2008 and 2012. So if a country’s actual emissions overshoot their binding target they need to buy international compliance units from other countries to increase their allowances to match their emissions. Alternatively, if a country over complies with its target by emitting less than its target for this period, it will have spare allowances and can sell them to countries that need them to be in compliance (Ward 2008b).

This intergovernmental cap-and-trade system (the emissions trading component of the Kyoto Protocol) creates incentives for countries to over comply with their binding target. (Ward 2008b).

## **2.2. New Zealand’s policy framework**

New Zealand is a signatory to the Kyoto Protocol and to enable New Zealand to meet its obligations, the government passed into law The Climate Change (Moderated Emissions Trading) Amendment Act 2009 in November modifying the existing emissions trading scheme (NZ ETS).

The NZ ETS is a domestic (devolved) emissions trading instrument but unlike the Kyoto Protocol is not a cap-and-trade instrument. Instead it functions more like a revenue neutral carbon tax payable in vouchers rather than cash. Under this system upstream emitters (e.g. large energy companies) are required to take responsibility for 100% of their emissions by matching their emissions with either New Zealand government units (NZUs allocated for free or auctioned by the government) or purchasing international Kyoto carbon units to match their emissions.

The cost of purchasing these Kyoto carbon units is passed downstream into the economy so that ultimately consumers cover this cost. This has the effect of introducing the carbon price into the economy but without a cap on domestic emissions. The sectors covered by the NZ ETS are forestry, stationary energy, transport, industrial processes, agriculture, fishing and waste sectors accounting for and surrendering emissions units.

Although actual emissions are created by the millions of users of products and services in New Zealand, it would be to problematic to make each individual responsible for their own emissions. As a result the focus is only on the large emitters at the top of the supply chain (known as Points of Obligation) in each sector.

The entry of sectors into the scheme will be phased in. Forestry entered on retrospectively in January 2008, transport, stationary energy, industrial processes and fishing will enter in July 2010, waste will enter in January 2012 and agriculture in January 2015. As sectors enter the scheme, the Points of Obligation will measure their emissions and surrender to government an equivalent amount of emissions units (Ministry for the Environment 2009).

The effect on the consumer is to provide a price signal that encourages them to alter their choices and behaviour and through that reduce emissions. The majority of people and businesses in New Zealand cannot participate in this market apart from paying more for their energy and transport fuel.

### **2.3. Voluntary offsetting and carbon neutrality aspirations**

There is a strong desire by a growing number of individuals and businesses to play their part and reduce their contribution to climate change. A common response is to voluntarily pursue the goal of carbon neutrality, which generally means achieving a zero net carbon footprint. Carbon neutrality programmes involve three steps:

1. Measuring your annual carbon footprint within a defined boundary (household or business).
2. Reducing your emissions where this is possible and affordable.
3. Offsetting your residual (or unavoidable) emissions by paying for and causing additional emission reductions to occur outside your boundary.

Offsetting emissions by reducing them elsewhere makes carbon neutrality possible because it is often very difficult, impossible, or prohibitively expensive to reduce emissions to zero inside any given household or business. This is because some emission reduction actions are relatively inexpensive, whereas others can be very expensive or effectively impossible to eliminate directly.

At this point the aspirant then has the option of doing nothing, waiting until cheaper technologies come on to the market to reduce emissions further or to pay for (and thereby cause) additional emission reductions to occur outside the business boundary, a concept known as offsetting.

In recent years the practise of offsetting one's emissions has grown in popularity and it is possible to "offset" anything from air travel to the purchase of a new vehicle. The key to the environmental integrity of offsetting emissions lies in the concept of 'additionality,' which means that the emissions reduced or sequestered in the offset project would not have occurred without the money arising from the sale of carbon credits to offset buyers.

The ease and low cost with which offsetting can take place has given offsetting a bad reputation, with some seeing it as being no different to the practice of papal indulgences, the emitter able to pay a fee and continue polluting.

It is noteworthy to recall however, that we are talking about voluntary behaviours where there is no obligation to reduce emissions or buy offsets. The purchase of offsets enables people and businesses to voluntarily take responsibility for their emissions and in the process generate finance for new emissions reduction activities.

Safeguarding the integrity of offsets necessitates quality assurance processes in the voluntary carbon market. This quality assurance is provided by voluntary carbon market standards in a similar fashion to other forms of voluntary standards in agriculture (organic labelling), forestry (sustainability labelling). Another layer of quality assurance is provided by carbon neutrality programmes which guide carbon neutrality aspirants through the measurement, reduction and offset methodologies.

Carbon neutrality and voluntary carbon market activities are a bottom-up way for individuals, households, small to medium size enterprises, councils and others to become involved in climate change mitigation in ways that top down price signals (carbon tax and emission trading schemes) never allow (Ward 2008a). They are also a means of enabling the community to demonstrate to the government that it is capable of reducing emissions without damaging the economy.

## **2.4. The response in Nelson**

Concerns regarding climate change are just as prevalent in Nelson as any other community and individuals and businesses are keen to participate and reduce the impacts of climate change, and many would welcome the opportunity to make use of carbon market instruments as a means of doing so at least cost (which is what emissions trading is designed to do).

Organizations like the Nelson Environment Centre established the Code Red programme to promote action, Nelson City Council became a member of the previous government's Communities for Climate Protection programme and some Nelson companies are measuring their footprint in order to better manage their emissions.

Others are also looking at options for carbon management and some businesses, and on one occasion a wedding organiser, have contacted Nelson City Council to see if they can offset their emissions through tree planting. Nelson based offset provider Offset the Rest Ltd have been selling offsets through an internet based brokerage for two year.

In that time Offset the Rest has found that there is an appetite among their clients to purchase offsets from a local source which Offset the Rest have not be able to assist them as they only trade in high quality carbon credits generated largely from renewable energy projects in developing countries.

Offset the Rest report that they have had approximately 70 requests since they launched, predominantly in the first year of business. Most enquiries related to offsetting through tree

planting, and were from both people wishing to offset and to generate carbon credits, though they also received enquiries from energy projects such as bio-diesel.

More recently the frequency of enquiries has decreased significantly; their sense that this is because people are better educated regarding offsetting and offset companies rather than interest declining (Pers comm. M Munro 2009).

There is also a view among some companies interested in acting on climate change that to purchasing offsets is “cheating” and that once in-house abatement has occurred then local tree planting is the next best option (Pers comm. J Sinner 2009).

Ironically however because of the way the Kyoto “cap and trade” system works to purchase offsets from India (a country outside the Kyoto compliance system) for example, is in fact better for the atmosphere. This is because a reduction of one tonne of CO<sub>2</sub> in New Zealand has the effect of helping the government meet its emissions reduction obligations under the Kyoto Protocol. For every tonne of CO<sub>2</sub> voluntarily reduced is one less tonne the government must find to meet its compliance obligation.

Assuming New Zealand is below its Kyoto emissions target, the one tonne voluntarily reduced can then be sold to another Kyoto country that has emissions in excess of its Kyoto obligations and that tonne of CO<sub>2</sub> is then emitted meaning the atmosphere is no better off. India on the other hand, has no obligation to meet under the Kyoto protocol, but can trade carbon credits called “Certified Emissions Reduction” (CER) with a country inside Kyoto like New Zealand.

These CERs are not included in the global Kyoto cap meaning that one tonne is a genuine reduction occurring in India, and the atmosphere is better off.

The perception however is that local is better as it keeps money in the local economy and encourages local mitigation and carbon sink activities. All of which are valid and justifiable reasons to source credits locally and suggests that there is a potential market for locally derived carbon units in Nelson.

### **3. CARBON REDUCTION INSTRUMENTS**

Like any market the carbon market has a demand side and a supply side. Demand for credits comes from those seeking to demonstrate corporate (and individual) social responsibility by purchasing carbon offsets (e.g. as part of a carbon neutrality exercise).

The supply of carbon credits comes from projects that generate carbon emission reductions or sink removals (carbon sequestration in forests), but where the project is not financial feasible without the money from the sale of carbon credits.

Nelson City Council is potentially able to participate in carbon markets on the supply side of this equation generating and selling carbon credits as a means of financing the up-scaling of emission reduction or sink removal activities.

Although the city council might be able to generate carbon credits from its solar saver scheme, this report will only look the possibility presented by the carbon sink potential of the cities parks, reserves and forests.

### **3.1. Kyoto compliant instruments**

#### **3.1.1. Forestry in the emissions trading scheme**

Forests were the first sector to enter the NZ ETS on the 1<sup>st</sup> of January 2008 because of their potential benefits to New Zealand as carbon sinks and to prevent the national carbon liability associated with deforestation<sup>2</sup>.

Growing forests absorb CO<sub>2</sub> from the atmosphere, and store the carbon as wood with one tonne of dried wood containing around 1.8 tonnes of CO<sub>2</sub>. When a forest is felled or burnt this carbon is released back to the atmosphere through smoke or decomposition of woody material.

Under the Kyoto Protocol rules CO<sub>2</sub> is deemed to be released to the atmosphere as soon as a tree is felled and removed from site. This is to simplify carbon trading rules in the face of complexities associated with the longevity of harvested wood products. If a tree residue remains on site then the CO<sub>2</sub> is deemed to have been released over a 10 year period.

Participation in the NZ ETS depends on when the forest was established. The base year for the Kyoto Protocol (and the NZ ETS) is 1990. In the forest carbon arena there are pre-1990 (non-Kyoto) and post-1990 (Kyoto) forest. Kyoto forests are those that were not forest on 31<sup>st</sup> December 1989 – i.e. were established since 1<sup>st</sup> January 1990.

In other words, any forest that was already established on the 1<sup>st</sup> of January 1990 lies outside the Kyoto carbon accounting system and the accounting system of the NZ ETS (unless deforested after 2007). Only Kyoto (post-1990) forests are eligible to opt into the NZ ETS which means accessing the benefits of selling carbon credits, and the liabilities of owning a large carbon balance.

Carbon credits can be sold while a forest is growing, and earn NZUs (carbon credits) which can be traded on the open market, as illustrated by a recent sale of forest credits to the Norwegian government (Hartley 2009).

---

<sup>2</sup> The term ‘deforestation’ in a climate policy context refers to the permanent removal of a forest and a permanent change to non-forest land use. The clear-felling of a plantation forest does not constitute ‘deforestation’ if that forest is replanted in the next rotation. On the other hand, converting a plantation forest to dairy farming does constitute ‘deforestation’ and is now subject to a substantial carbon penalty under the NZ ETS.

But when it comes to harvesting the timber or if the forest burns down you have to surrender your NZUs (if you have not sold them) or buy NZUs for the amount of emissions generated from the loss of standing carbon. There is a risk associated with opting into the NZ ETS therefore and why carbon financing in the plantation forest sector is principally an activity for those capable of aggregating a large area of forest to spread this risk.

If you are growing new permanent forest with no intention of harvesting then the carbon finance risk is lower (although there is still the risk of fire).

If forest owners do not opt into the scheme then the government retains responsibility for the credits and liabilities for post 1989 (Kyoto) forests. Post-1989 forest owners can opt into the NZ ETS at anytime. For pre-1990 forests the owner does face obligations but only if they harvest and do not replant. This requirement only applies to exotic forests because the Forest Amendment Act prevents deforestation of indigenous forest (Ministry for the Environment 2009).

With an area of approximately 690 hectares in forested land there is clearly potential for Nelson City Council to benefit from opting into the NZ ETS. Before it chooses to do so, however it needs to closely consider the liabilities as well as the benefits of this option.

### **3.1.2. Permanent forest sink initiative and afforestation grant scheme**

The *permanent forest sinks initiative* (PFSI) that is part of the Ministry for Agriculture and Forestry's sustainable forestry programme. It enables landowners like the NCC to gain Kyoto compliant carbon credits by establishing new permanent forest (Ministry of Agriculture and Forestry 2009a). These credits can then be sold or kept to enable the landowner to meet obligations under the NZ ETS.

To be eligible, the forest must be human induced, either through planting or seeding or the promotion of natural seed sources (*Ibid*) and must have been non-forest land on 31<sup>st</sup> December 1989 (i.e. it must be Kyoto forest). A PFSI participant will covenant the forest against the title for at least 50 years to prevent harvesting, though limited harvesting is permitted with no less than 80% cover retained after harvest.

Similar to the NZ ETS, a forest owner is given credits for the carbon sequestered by the forest, gaining extra credits if the forest area increases and surrendering units if the forest area decreases (through harvesting or fire). A forest owner can opt into either scheme, but not both and once in the NZ ETS cannot change to PFSI. They can however change from PFSI to NZ ETS (*Ibid*).

Similarly the *afforestation grant scheme* (AGS) is a contestable fund operated by the Ministry of Agriculture and Forestry as an alternative way to encourage the establishment of carbon sinks and Kyoto compliant new forests. There are two pools of funds, one for private landowners and a second for participating regional councils who administer similar schemes in

their own regions (Nelson is not a participating regional council) (Ministry of Agriculture and Forestry 2009b).

Under the AGS however the carbon credits generated from the new forest are retained by the government as well as any liabilities. Instead of the carbon credits, the benefit for the landowner is that they can plant a new forest at no cost to themselves.

To be eligible the forest area must be at least five hectares but this can be in more than one block (a minimum of one hectare for each block) and on more than one title (*Ibid*).

The land must also have been non-forested land on 31<sup>st</sup> December 1989, or forest on that date but deforested by the 31<sup>st</sup> of December 2007 or deforested after the 1<sup>st</sup> of January 2008 as long as any ETS liabilities have been met (*Ibid*). Areas entered into either the NZ ETS or the PFSI are not eligible under the AGS.

If Nelson City Council is interested in obtaining further details about any of these forestry options then advice should be sought from a carbon forestry expert.

### **3.1.3. Emissions biodiversity exchange in the 21<sup>st</sup> century**

Emissions biodiversity 21<sup>st</sup> century (EBEX21) is a forest regeneration project run by Landcare Research and landowners and was designed as proof of concept for the PFSI. Here landowners with areas of regenerating native forest larger than 50 hectares are able to gain carbon credits to help finance their regeneration activity (e.g. gain an income from carbon in lieu of grazing). The carbon credits are then sold through the Carbon Zero programme (also run by Landcare Research) to companies and firms either looking to offset in a carbon neutrality exercise.

The scheme is similar to PSFI, the main differences that EBEX21 is run by Landcare Research not the crown and incorporates biodiversity measurement (vegetation biodiversity only) into the project methodology. Eligible forests must meet the Kyoto Protocol's afforestation definition as well as several EBEX21 specific such as proximity to wind and bird carried seed sources but is open to any landowner who can meet these criteria.

EBEX21 has disadvantages that some of the other options outlined do not, for example restricts land management options to an extent (for example tree planting) and where the credits can be sold, but it might be a useful option for some reserves and, similar to the credits outline in section 3.2.2, will result in co-benefits for the land such as biodiversity.



---

## 3.2. Voluntary mechanisms

### 3.2.1. *International voluntary carbon market*

The Kyoto Protocol applies emissions from virtually all sectors of the economy. There are, however, several exclusions, international aviation, marine bunker fuel and soil carbon. Additionally, article 3.4 of the protocol the inclusion of management of pre-1990 forests was optional for countries (UNFCCC. 2009) and New Zealand opted not to participate and for this reason pre-1990 forests are excluded from the NZ ETS.

Because non-Kyoto forests lie outside the accounting system of the NZ ETS does not mean they are ineligible for generating carbon credits. It just means that they are ineligible under the compliance carbon market. But there is a voluntary carbon market and this market includes sectors and activities that are not eligible under the compliance market (i.e not eligible under the NZ ETS). In other words, owners of non-Kyoto forests are still eligible to generate carbon credits so long as the project methodologies meet the quality assurance criteria of voluntary carbon market standards.

Possible applicable projects including increasing soil carbon through the introduction of an agent such as bio-char and demonstrable changes to pre-1990 forest management that increase the carbon sequestered by the forest.

There are presently soil carbon based projects occurring in New Zealand so as long as the permanent increase in soil carbon can be demonstrated in comparison with a baseline (business-as-usual) scenario can be generated. Soil carbon credits may be possible under the international Voluntary Carbon Standard.

The area of pest and weed control on the other hand is less tested with anecdotal research to suggest that while there are clearly biodiversity benefits from pest and weed control, the additional sequestration of carbon might not be one of them (Pers comm. S Weaver 2009). This is because studies so far have indicated that pest and weed control may alter the composition of a forest without altering the rate of biomass growth (i.e. where less palatable species grow faster because there is less competition). However, while this means that more research is required into this area before it is likely to be pick-up by a programme such as the Voluntary Carbon Standard it does not mean credits of some kind are not possible.

This presents an opportunity for an alternative voluntary standard with a wider definition of what is a possible carbon credit such as the proposed Tasman Voluntary Carbon Standard. This will be looked at in more detail in section 3.2.2 below.

### **3.2.2. Proposed tasman voluntary carbon instrument**

The Tasman Voluntary Carbon Instrument (TVCI) is a proposed domestic voluntary carbon market being developed in Nelson as a means of helping to fill a gap in the carbon market.

There is some complex debate about the legitimacy of voluntary carbon markets operating within economies with a regulated carbon market in place, such as New Zealand. The group developing the TVCI standard, however, are of the opinion that these issues can be addressed by careful and clear definitions and standards.

The TVCI is fundamentally a tool aimed at generating bottom up behaviour change to achieve climate change mitigation. Such bottom-up behaviour change is not always generated by top-down schemes such as the NZ ETS, particularly in sectors such as electricity and transport which are extremely inelastic meaning the price must increase significantly before consumers seek a cheaper alternative.

As a result complimentary measures are required to obtain the behaviour change sought by the NZ ETS and the TVCI is one local method that may make this possible.

An example of a project that may be eligible under the TVCI include aggregating carbon sequestration from planted areas of less than 20 metres wide, such as street trees and riparian plantings. Under the compliance schemes (NZ ETS and PFSI) it is not possible to generate carbon credits from individual trees and forests less than 20 metres wide. The TVCI is considering including such projects and aggregating the emissions reductions from street trees and planting strips throughout the city.

Other possible project types in the proposed TVCS) include:

- native forest regeneration projects
- agricultural emissions reduction through changes in land use practices
- agricultural and horticulture emissions reduction through effluent capture and bio digestion for biogas production
- scaling up solar technology uptake in urban households
- soil carbon storage through bio char production from waste wood
- clean tech construction in the building sector
- car pooling and other mass transport projects
- transport fuel swaps (e.g. fossil diesel to bio diesel via waste vegetable oil feedstocks)
- aggregated community and/or business energy efficiency programmes

At this stage the TVCI is in the early stage of development and projects such as those outlined above cannot be guaranteed as it will depend on what the final standard looks like. However there is significant potential from the TVCI and for Nelson City Council to use the TVCI to generate emissions credits from its parks, reserves and forests.

## 4. THE CO-BENEFITS OF CARBON CREDITS

Outlined above are five mechanisms that could gain carbon credits from the sequestration of carbon from tree planting. Often such sequestration projects also result in co-benefits, for example pest and weed removal from pre-1990 forests, while there may be little additional carbon sequestered as a result of such an intervention there will be benefits such as increased biodiversity.

Also there is interest from companies and individuals in tree planting on council parks and reserves as evident from the popularity of City Council planting days and it may be that they will equally, be interested in planting as an exercise in carbon offsetting.

NCC could take advantage of this interest, developing a tree planting programme for people wishing to offset or make another contribution for example tourists (visitors to the Rugby World Cup), local businesses or individuals.

Kaikoura developed a programme similar to this in 2003 called Trees for Travellers, where seeds and seedlings are collected locally and grown in a small nursery. The trees are then purchased by Kaikoura's tourists and planted on a local and previously undeveloped reserve in central Kaikoura.

The trees are sold ostensibly as offsets for the tourists travel but the planting of one tree will make limited difference when the tourist has travelled from London. Also this will only work directly as an offset once the tree has sequestered the equivalent carbon from the atmosphere through the course of its life.

To complicate things further; international air travel lies outside the Kyoto Protocol carbon accounting system, but the post-1990 tree planting (as in the above example) lies inside this accounting system. So, the trees planted will become incorporated into New Zealand's national carbon accounting system and be counted as a contribution to the national binding target.

The result of this could be that same trees are sold as offsets and counted by tourists offsetting emissions from international air travel and by the New Zealand government, meaning a situation of double counting has occurred. Accordingly, it is important to match emissions with appropriate types of offsets with emissions from international air travel (not covered by the Kyoto Protocol) offset by activities not covered by the Kyoto Protocol (e.g. soil carbon projects or activities in non-Kyoto forests).

In the Kaikoura example, the planting scheme could be promoted as a means of offsetting domestic air travel (where both the plantings and the emissions are covered by Kyoto accounting). Perhaps more accurately the trees could be sold as a means of enhancing the local environment for biodiversity and scenic values rather than as carbon credits.

The scheme has been relatively popular since its inception particularly when this whole “story” is told to travellers and there is no reason why a similar project could not work in Nelson.

Tree planting projects on lands owned by the Nelson City Council could also be part of a programme within the Council to lower its net carbon footprint. In any carbon footprint measurement exercise the carbon footprint is calculated as the net result of emissions minus any carbon sequestration occurring within the project boundary for that year. The Council can therefore measure the sequestration occurring on its own estate and use this to internally offset a proportion of its emissions from fossil fuels.

This will have the effect of lowering its net emissions and potentially make it easier (cheaper) to achieve a situation of carbon neutrality if this were ever a goal or obligation. If the Council wishes to use the sequestration occurring on its own estate in the way, the same sequestration could not be used as offsets by individuals and businesses who engaged in community tree planting activities. One option is to do a little of both by:

- a. Demarcating areas of Council lands that are used only for its internal carbon accounting, and
- b. Demarcating areas of Council lands that will not be used in its internal carbon accounting and which will be available as community offset projects.

There are many reasons for planting trees, carbon sequestration is just be one of them. In developing a local offsetting programme that builds on the co-benefits associated with tree planting, NCC could find it not only generates carbon credits but also gains a considerable number of co-benefits in the process.

## 5. CONCLUSION

For carbon credits to be acceptable to a purchaser seeking carbon neutrality the carbon credits need to be credible. The key to ensuring this is to ensure the emission reductions or sink removals are *real* (they are actually happen and can be measured), *verifiable* (a third party can audit the process), and *additional* (so the emissions reductions or sink removals would not have happened anyway) (Ward 2008b).

This report has outlined five possible approaches for Nelson City Council to potentially use carbon financing in the environmental management of its parks forests and reserves. The options presented include both compliance and voluntary carbon market instruments. The different options have different rules and eligibility criteria, and generate different outcomes for the atmosphere. The key from a strategic planning point of view is to match the planning goal with the most appropriate carbon financing approach.

In part B of this report the applicability of each option will be applied to the different reserves in Nelson, the most appropriate options identified and how each might be implemented will be established.

## 6. REFERENCES

- Flannery T 2005. *The Weather Makers; The History and Future Impacts of Climate Change*. The Text Publishing Company, Melbourne Australia.
- Goodwin EO 2009. *Effects if Climate Change on the Nelson-Tasman Region*. Prepared for Prepared for SolarCity. 13 p.
- Hartley S 2009. *Forest carbon credit sale world's biggest*. In *Otago Daily Times*. Dunedin.
- Ministry for the Environment 2009. *Climate Change Information, The New Zealand Emissions Trading Scheme*. Retrieved 15 December 2009, from <http://www.climatechange.govt.nz/emissions-trading-scheme/index.html>
- Ministry of Agriculture and Forestry 2009a. *Permenent Forest Sink Initiative Guidelines*. Retrieved 15 December 2009, from <http://www.maf.govt.nz/forestry/pfsi/pfsi-guidelines/page.htm>
- Ministry of Agriculture and Forestry 2009b. *Afforestation Grant Scheme*. Retrieved 15 December 2009, from <http://www.maf.govt.nz/climatechange/forestry/initiatives/ags/>
- Stern N 2006. *The economics of Climate Change: The Stern Review*. Cambridge University Press, Cambridge: UK.
- UNFCC 2009. *Kyoto Protocol*. Retrieved 14 December, from [http://en.wikipedia.org/wiki/Kyoto\\_Protocol](http://en.wikipedia.org/wiki/Kyoto_Protocol)
- UNFCCC 2009. *Essential background, The Kyoto Protocol*. Retrieved 15 December 2009, from [http://unfccc.int/essential\\_background/kyoto\\_protocol/items/1678.php](http://unfccc.int/essential_background/kyoto_protocol/items/1678.php)
- Ward M, Weaver S 2008a. *Voluntary market activities - is there a role in Kyoto countries?* 8 p.
- Ward M, Weaver S 2008b. *The Meaning of Carbon Neutrality inside jurisdictions with 'caps'*. 24 p.