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Author Neil McCabe
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L-R bottom: F/F Brian Gilbert, F/F Cathal MacCobb, F/F James Eagers, F/F Neil McCabe, F/F Vincent Savage
L-T Top: F/F Robert Kane, S/O Paul Hendricken
CHIEFS FORWARD

Sustainable Energy Consumption is a key part of the future of Dublin City and its people and I am delighted to see the production of Dublin Fire Brigade’s Green Plan for Kilbarrack Fire Station. This plan shows forward thinking and vision for a more sustainable and cost effective future and will help to achieve some of the objectives of the Dublin City Development Plan.

The staff of Kilbarrack Fire Station are responsible for the delivery of this Green Plan which aims to effect change throughout Dublin Fire Brigade. The plan outlines how Dublin Fire Brigade can implement changes that reduce the cost of running our Fire Service, while decreasing our impact on the environment. The Plan highlights many inexpensive measures that will reduce our Carbon Foot Print.

I commend the time and effort put into the Green Plan by Neil, the crew of Kilbarrack Fire Station, the individuals and the groups who have contributed to its content. I wish the Green Plan every success and assure continued support for its implementation.

VISION

In the changing future Dublin Fire Brigade will be world leaders of sustainability, recognised for their championing of energy and water consumption reduction, waste prevention, biodiversity protection and impacts on society. Dublin Fire Brigade will be the exemplar, running its fleet of emergency vehicles on Biodiesel and will insist on Green Procurement for the services it provides.

MISSION

As Dublin Fire Brigade (DFB) approaches 150 years in service to the citizens of Dublin providing safety and protection to all, we now intend to use the model of the Green Plan to become leaders of sustainable energy, to maximise our low carbon future and to empower people to effect change in our Fire Brigade and the local community itself.
EXECUTIVE SUMMARY

The concept of the Green Plan for Kilbarrack Fire Station is to use a sustainable approach and practice that will use world’s best practices, forward collective thinking and new technologies to:

1. Significantly reduce energy and water consumption
2. Reduce the volume of domestic waste created with an aim to prevent it entirely
3. Save money by reducing the energy running costs by up to 80% and reinvest these savings in the Fire Station
4. To use the three point system of Low Capital Outlay, Quick Payback Period and Adaptability
5. Deliver services differently engaging local community within DFB and in our surrounding community including outreach programmes
6. To create a Carbon Neutral Fire Station that can trade Carbon Credits

INTRODUCTION

Dublin Fire Brigade was officially formed in 1862 and is fast approaching 150 years operating in 2012. Throughout our history we have been held high in the public’s esteem with a place and standing in our community, delivering protection and safety. Now we in Kilbarrack Fire Station intend to become leaders in Sustainable Energy Consumption, empowering people to effect change within our Fire Brigade and the local community itself.

This Green Plan has been created for Dublin Fire Brigade as a means to securing a better understanding of sustainability and the production of green house gases. This is a holistic approach that only comes from actual actions taken across the seven themes below. This Green Plan was written at the beginning of the downturn in the economy and so offers an opportunity for the Public Service to reduce its impact on the environment, motivate staff and save money transparently.

As we look forward to future energy consumption we need to reduce our use of and dependence on costly fossil fuels such as oil and gas. Contained in this document are the steps that have been taken to research and install new technologies in Kilbarrack Fire Station over the past four years.

The Green Plan can and should be used as a template for all DFB stations to follow. I believe this Green Plan and the work carried out in Kilbarrack Fire Station to be an exemplar, for our own Dublin City Council and indeed other Fire Brigades in this country to follow.

F/F Neil McCabe
Author Green Plan
Kilbarrack Fire Station has been named as the Flagship for the Sustainability Report 2010 for Dublin City Council. The Sustainability Report will be an annual report that sets out visions and actions for increasing the economic, social and environmental sustainability of Dublin City Council. This sustainability report is the first of its kind in Ireland.

SUSTAINABILITY

The definition on sustainability for the Green Plan is in keeping with the four pillars of The Natural Step listed below:

1. Resources like fossil fuels, metals and minerals are finite and can damage our environment if allowed to accumulate. Therefore, we will minimise the consumption of materials extracted from the Earth’s crust.
2. The accumulation of persistent chemicals (pesticides, fertilizers etc.), and unnaturally high nutrient concentrations are harmful to people and the environment. Therefore, we will reduce our dependence on man-made chemicals.
3. Ecosystems take a long time to recover from physical destruction (if they can at all), we will mitigate our impact through wise land use policies, low impact maintenance practices and environmentally friendly design.
4. Our community will not be truly sustainable unless our residents are healthy, safe and prospering. Therefore, we will continue to pursue policies and actions that minimise the barriers that impede stakeholder’s ability to meet their basic needs.
THE DUBLIN CITY DEVELOPMENT PLAN
The Dublin City Development Plan provides the strategic framework and policy context for the sustainable development of the city. It focuses on the creation of a compact, well-connected city at the heart of the region, combined with an enhanced quality of life for existing and future residents.

GREEN PLAN OVERVIEW

THEMES:
The seven themes of the Green Plan are:

I. Energy
II. Water
III. Waste
IV. Biodiversity
V. Transport
VI. Society
VII. Procurement

CONTEXT:
In the context section problem areas of the Kilbarrack Fire Station are identified per theme. This leads to the actions that have to be taken. These actions are only taken after Energy and Carbon Auditing under the ISO14064 standard has been carried out.

ACTIONS:
There are actions for each theme and some actions impact on more than one theme at a time. The actions will help the Green Plan make achievements. These actions have been split up into three phases of work and all three phases have their own cost analysis report for Senior Dublin Fire Brigade Management.

The phases of work are listed below. Each phase will have a capital outlay, a CO₂ emission reduction; payback period and saving per annum. These actions are contained in a matrix for each phase of work in Appendix 2.

F/F Alan Corcoran
PHASE I SHORT TERM ACTIONS:
These are relatively quick, small scale projects with a high yield return on investment, low capital expense and a quick payback period.

PHASE II MEDIUM TERM ACTIONS:
This is a relatively big project that involves some large-scale work with a lower payback period and a lesser return on initial investment. However this work is imperative as it is fundamental to the success of the total project and at the same time is Governed by the three point system above.

ACHIEVEMENTS:
Out lined in each theme will be the achievements to date from the actions taken in implementing the Green Plan. This will include a second Energy and Carbon Assessment

FUTURE ACTIONS:
Phase III actions are actions that I intend to start in November 2010. The Capital Funding required for these actions will come from the ring-fenced savings created by the actions taken in Phase (I) and Phase (II).

PHASE III LONG TERM ACTIONS:
This is the final work to be carried out to the station. As the Fire Station is undergoing a retrofit process to accept new technologies, I have saved these works until the end of the Phase II works. Therefore this will cut down on work duplication and prove to be cost effective.

CORE PRINCIPALS

BEHAVIOURAL CHANGE:
Behavioural change has no upfront cost and the Stations Crew are part of the solution. Behavioural change is free and is the fundamental unit driving the success of Green Plan. Fire fighters and officers alike bought into the idea of a shared responsibility for their Fire Station. This is reflected in each theme mentioned above.

Only 60 years ago people in Ireland had meters for gas and electricity and so were constantly aware of how much energy they consumed. Now very few are aware of how much energy they use anymore. In Kilbarrack Fire Station the “we must do something” approach has been removed has been replaced with actual actions and technologies. The Stations Crew are stakeholders and an intrinsic part of the Green Plan.

CARBON EMISSION REDUCTION:
The first term of reference (goal) of the Green Plan has been the highlighting and reduction of the unnecessary carbon emissions produced by Kilbarrack Fire Station. We have to measure our CO$_2$ emissions and be transparent so that we can enthusiastically track changes from the original base line and show hard line evidence that the project is achieving its goals and targets.

Our intention is to manage and report our emission reductions in accordance with ISO standards so that we will be in a position to trade carbon credits on the Irish Domestic Voluntary Carbon Market due to launch in May 2011.
**ENERGY**

**CONTEXT**

The old boiler was converted to gas when with the arrival of town gas to the Kilbarrack area. This non-condensing boiler has been independently assessed and after 22 years had reached the end of its working life. The boiler was 68% energy inefficient.

The controls and zoning of the heating system were limited and result in energy deficiencies. Unnecessary heat loss was occurring in various parts of the station. The former cloakroom downstairs was over heated and Space Heaters were running 24 hours a day unnecessarily.

The internal and external lights and light fittings in Kilbarrack Fire station did not provide a high level of visual comfort or the best light for the task. They had high energy consumption and the controls are not flexible.

Large triple panel high water content radiators with damaged controls were permanently running consuming large amounts of water and energy. Almost all pipe work was not lagged or insufficiently lagged when compared to modern standards.

**ACTIONS**

**PHASE (I)**

I. Apply to SEEFP for financial assistance
II. Apply to switch electrical energy provider to Airtricity
III. Retro fit Thermodynamic Solar Collector Panels
IV. Retro fit a new heating system with room stats and advanced heating controls
V. Retro fit Remeha Quinta gas condensing boilers
VI. Remove Space Heaters from the fourth heating circuit
VII. Retro fit internal and external Lumisaver lights and light fittings

**PHASE (II)**

I. Retro fit photocells for internal daylight hour’s savings
II. Retro fit low water content radiators and all associated pipe work
III. Lag all new and old pipe work to highest standards
IV. Retro fit energy saving Sava Flow equipment to all appliances in Station Kitchen
V. Commence ISO14064 Energy and Carbon Auditing
ACHIEVEMENTS

I. 80% of the Stations hot water is produced daily by the thermodynamic panels
II. The new boilers are 98% efficient
III. Removing the Space Heaters has made savings of one Ton of CO₂ and over €1,200 P.A.
IV. Electricity consumption has been reduced by 80%
V. The Station is permanently at one temperature reducing boiler work load and creating a better healthier working environment for the staff
VI. Appliances have a reduced output of over 50%
VII. The Station energy consumption has dropped by 80% resulting in a reduction in the level of Oil being burned every day by 200 litres and a saving of 1,500KwHr of energy per day.

FUTURE ACTIONS

PHASE (III)

I. Install urban wind turbine and cellular backup system
II. Retro fit State of the art energy efficient Hand driers
III. Install artificial stream at 15lpm for micro hydro system
IV. 100oC energy saving boiling water tap
V. Data logging of all DFB Stations for wind flow direction and force
VI. Air pump technology for all DFB Station roofs
VII. HVAC Recovery system for Station space heating system
VIII. Boilerhouse heat exchange recovery system
IX. Construct and installation of new high U value window on first floor covering that will release trapped heat at night time and lessen the demand on the boiler
X. Station Office roof refurbishment project. This project will increase the overall U Value of the Fire Station and reduce heat loss by a further 25% representing a total energy reduction of 96%
WATER

CONTEXT
Water is a valuable resource, yet it is very often taken for granted. There are many good reasons for making sure we only use the water we need. Scarcity and misuse of fresh water pose a serious and growing threat to sustainable development and protection of the environment. Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment.

Kilbarrack Fire Station used to consume 5m³ of water per day. 3.3m³ of water is used daily on the necessary testing and filling of Fire appliance pumps and equipment. 2m³ of water was used daily by the stations kitchen, toilets and shower areas.

An average of 14m³ per week of Rain water passed along the gutters from the roof space. This water and the waste water from the showers, wash hand basins, urinals, toilets and kitchen returned to the main drains untreated.

The Urinals used to flush 9 litres of water, every five minutes, 24 hours a day, 365 days a year. Using water to dispose of water makes no economic sense, particularly in a world facing a very limited supply of readily available fresh water. Over 237,520 litres per year was flushed away needlessly by only two urinals. The showers had old fashioned shower heads that used large volumes of water per min while in use.

ACTIONS

PHASE (I)
I. Set up internal partnership with Water Conservation Department
II. Water meters have been installed
III. Retro fit motion sensor taps, mixing valves and sanitary ware
IV. Retro fit reduced flow shower heads and pressurise the water system of the station
V. Retro fit waterless urinals
VI. Install Rain water Harvesting System
VII. Install waste water Treatment works on site

PHASE (II)
I. Retro fit Fat trap in kitchen
II. Pressure buttons with timers and Sparge works for the daily cleaning of the urinals
III. Install four water butts for the gardens and the Glass House
IV. Commence ISO 14064 Carbon and Energy Auditing
V. Commence feasibility study to site a Well on Kilbarrack Fire Station grounds

Waste Water Treatment and Harvesting Works

ACHIEVEMENTS
I. Water consumption of the Station has been reduced by 1,500,000 litres P.A.
II. The cost of water to and from the station has dropped by 90%
III. Return of fats and oils to the main drains reduced by over 90%
IV. 100% of the water for our gardens is harvested on site
V. All water collected from the roof space is treated and returned with all the wastewater from the showers, wash hand basins and kitchen to the holding tank for use on the Stations Emergency Appliance

FUTURE ACTIONS

PHASE (III)
I. Drill yard pump test water collection system
II. Collect liquid Nitrogen for DCC Parks Dept.
III. Hydroponics system for liquid Nitrogen
IV. Faecal Separator treatment chamber
V. Advanced Reed Bed works on site
VI. Flow metering for the Frontline Emergency Vehicle D61
VII. Advanced second level rainwater harvesting system to provide shower water and wash hand basin water. Back up supply to rain water holding tank for the D61 frontline appliance

Rain Water Harvesting Tank

Recycling two glass bottles saves enough energy to boil water for five cups of tea.
WASTE

CONTEXT

FABRIC
Kilbarrack Fire Station is a two-storey building, which was constructed between 1969 and 1973 using traditional cavity wall construction. All windows are single glazed and insulation levels remain as per the original construction. The station was built at a time when the use of costly fossil fuels and energy consumption where not high on the agenda. This is reflected in the Stations Fabric and Envelope as 35% of the Stations heat produced is wasted through the 2 Nr gable walls.

INSULATION
Until now Kilbarrack Fire station has not benefited from any refurbishment or renovation over the last few decades. The main problem areas are the single glaze windows, window panels, doors and door frames, insulation in the roof, loft spaces and wall cavities.

AIR LEAKAGE
Kilbarrack Fire Station leaks out over 10 ton of CO₂ each year through its building fabric. An air tightness test was carried out in Kilbarrack Fire Station in September 2008. The Station did not meet current building standards, achieving a result of 12.44m³ / (hr.m²)@50Pa. This is below the lowest legal standard.

LAGGING
Distribution losses are occurring through the un-insulated pipe work. Lack of control meant the windows need to be opened to provide cooling while the heating was still in operation at the same time condensation was occurring all over the Fire Station causing rot and other damage. The pipe work in most of the station needed to be insulated to reduce energy costs.

STATION WASTE
100% of consumables produced in the station were going to landfill. This also included bottles, cardboard, tins and plastics used in the kitchen for cooking as well as all Fire and Ambulance equipment packaging. 100% of organic waste created was put in the domestic bin this also included wood cuttings from the grounds of the station. Staff made a moral decision to begin collecting consumables produced in the Station and to bring them to recycle centres on their own time in their own vehicles. This included bottles, cardboard, plastic, paper and tin.
**ACTIONS**

**PHASE (I)**

I. Document volumes of waste created
II. Collect recyclables and consumables produced on site and bring to Recycle Centres
III. Collect batteries as an exercise to show Station Crew participation in a behavioural change programme.

**PHASE (II)**

I. Set up internal partnership with D.C.C. Joinery Department
II. Retro fit sustainably sourced, certified wooden doors, doorframes, windows, window frames and window panels
III. Seal and insulate all openings of the Station
IV. Lag all new and old pipe work to highest standards
V. Install 6m² compost bay including a pig recycler for meats
VI. Install a 22m recycling bay including WEEE waste bank: bottle banks: Florescent lights bank: Used cooking oil (UCO) collector:
VII. Remove No. 1 Euro Bin from Station

**ACHIEVEMENTS**

I. Eight Public Private Partnerships have been set up to create the new recycle bay in the Fire Station
II. The stations retro fit has prevented 10 Ton CO₂ from leaking out through the fabric and is directly impacting on the running costs of the station, contributing to an lower boiler demand
III. 100% of the glass, paper, plastic, and tin produced on site are recycled
IV. 100% of organic waste produced on site is composted
V. 40% of all station waste is now recycled
VI. Kilbarrack Fire Station has become airtight and we are eradicating the sick building syndrome previously attached to the Fire Station
VII. Condensation, rot, tarnish and other problems to the Fire Stations interior have been eradicated
VIII. Stations Energy consumption has dropped by 80%, this has reduced almost 200 litres of Oil being burned per day and over 1,500 kWhr of Energy to match the Stations Energy demands
IX. Almost 2,000 kWhr of energy has been saved by the glass bottle recycling in the Fire Station to date. This equates to a total reduction of 1,200 tons of CO₂ emissions prevented in the production of glass from mining and has prevented over 2,000 litres of oil from being burned. The average domestic dwelling consumes 2,500 kWhr of energy per annum.

**FUTURE ACTIONS**

**PHASE (III)**

I. Insulation rendering including injection moulding of pier walls
II. Insulate Roof space with Seal action 500
III. Expand recycle bay to include extra receptacles: 50% recycling target by 2011
IV. Improve overall Station U Value by retro fitting new necessary Station Office Roof project with living roof sedum garden and incorporating external gable wall insulation.
V. Paint Fire Stations Beams and Piers using Plastic coat painting


BIODIVERSITY

CONTEXT

Biodiversity is the variety of all natural life and the interactions between organisms and ecosystems. It includes single-celled organisms that help soil formation processes, earthworms in the soil, plants that grow on the soil, insects that pollinate the plants and animals that eat the insects. Most importantly humans cause habitat loss. It is only with interaction and understanding that human behaviour can be a contributing factor to both habitat replenishment and ecosystem recovery and survival.

There were six Sycamore trees growing on waste land of approx 60m² to the east of the Fire Station. This area receives little or no light and has never had a specific use. The area was hard to maintain and always looked dreary and not very inviting. It was demotivating to the Stations Crew and the lands potential was always over looked.

At the south of the station there was an area of approximately 90m² of grounds that had turned into waste land over the 40 years since the station opened. This area never really served any purpose as it is located behind the Fire Stations Tower. I noticed that this area combined with the area to the east of the station would be sufficient to start a Biodiversity project. There would also be enough space to grow in season vegetables for the Stations Crew.

PHASE (I)

I. Set up internal partnership with D.C.C. Parks Department
II. Carry out a Biodiversity Feasibility Study on the grounds of the Station
III. Write a Biodiversity Action Plan for Kilbarrack Fire Station
IV. Commission CAD drawings of BAP
V. Designate east facing area as Biodiversity Woodland garden and recreational garden
VI. Designate south facing area as Commemorative Garden for DFB*
VII. Designate south east facing area as Allotment Garden**
VIII. Clear all grounds of debris and segregate waste for recycling, all labour to be carried out by Fire Stations Crew at no cost to DFB Management or DCC
IX. Prepare sites for Beehives
X. Install 6m² Compost bay including a pig recycler for meats
XI. Install four water butts for the gardens
XII. Conduct feasibility study for Glass House at rear of handball alley

*All commemorative garden work now under Society Theme
**All allotment garden work now under Procurement Theme
**PHASE (II)**

I. Begin ground works and landscaping on all grounds  
II. Excavate site for raised garden and wood land project  
III. Construct and install Beehives  
IV. Construct and erect bird houses and artificial roosts for bats, from waste timbers from retro fit of the Fire Station including a 1000 capacity Bat Roost  
V. Construct insect habitats and ecosystems below ground. Use percolating media and chambers also include wood cuttings above ground donated by DCC Parks Department  
VI. Construct decking area  
VII. Plant native trees and species in all gardens including a 20 year old Oak Tree

**ACHIEVEMENTS**

I. We are now working together under an umbrella of partnership with DCC Parks Department and the Joinery Workshop  
II. We are composting 100% of all organic waste created in the station  
III. There is a comprehensive Biodiversity Action Plan written for Kilbarrack Fire Station by Neil McCabe  
IV. We now have four dedicated gardens on site protecting the eco systems we have helped create and nurture  
V. There are two working Beehives on site  
VI. 100% of the water for our gardens is harvested on site  
VII. A Public Private Partnership with local tree surgeons has been established: over ten ton of Local shredded wood chippings is delivered every 2 x months. This wood is then used in garden projects and available to the Fire Station Crew to take home and use on their own gardens at no cost.
**FUTURE ACTIONS**

**PHASE (III)**

I. Biodiversity Action days with the nine local National Schools

II. Install a Wormery in the Woodland Garden supported with liquid from the composting area.

III. Begin documenting and filming wildlife living in the grounds of the station

IV. Install a pond for wildlife using the treated waste water from the station

V. Increase below ground artificial eco system habitat as per Biodiversity Action Plan

VI. Production of Honey

VII. Categorising and documentation of insect and wildlife species for Biodiversity Action Plan review 2015

VIII. Commence Infra red filming of nocturnal activities of Bats in the Artificial Bat Roost in the Fire Station.
TRANSPORT

CONTEXT
Dublin Fire Brigade uses approximately 531,500 litres of diesel per year to operate a total of 124 Fire Appliances and Ambulances. All appliances run on regular fossil diesel. Most stations have a diesel tank in situ, which could be convenient for the distribution aspect and efficient delivery of smooth mixed 30% B Biodiesel.

Dublin Fire Brigade could reduce the Carbon emissions of its fleet by an estimated 175 tons per year. This would represent a reduction in future Carbon Taxes of an estimated €4,000 per annum.

Biodiesel is a clean burning fuel, which runs in any unmodified diesel engine. This fuel is an environmentally friendly alternative to the higher emission petroleum diesel used in large transport vehicles and some cars and trucks. In addition, the 30% B Biodiesel referred to in this Green Plan is produced using Used Cooking Oil (U.C.O.), an abundant waste product.

30%B Biodiesel from Used Cooking Oil, mixed with regular diesel provides DFB with an opportunity to become fuel independent. In today’s climate of economic uncertainty we must consider an alternative, less costly sustainable option to fuel our fleet of vehicles. There is potential for D.F.B. Fleet to reduce its fuel costs by 25%. This would also represent almost 200 tons of CO₂ emissions being reduced per annum.

ACTIONS

PHASE (I)
I. Begin collecting Used cooking oil on site from the Fire Station kitchen
II. 10% of staff participation in DCC cycle to work scheme
III. Draft Biodiesel Report
IV. Carry out feasibility study on the use of hybrid and Electrical appliances for DFB Emergency Services Fleet of vehicles

PHASE (II)
I. Launch Biodiesel report
II. 25 % of staff participating in DCC Cycle to work scheme
III. 30% B Biodiesel Trial in Kilbarrack Fire Station
IV. Build bike shed for Station Crew
V. Commence collecting used cooking oil from Fire Stations Crew domestic kitchens and install a collecting tank
ACHIEVEMENTS

I. Biodiesel Report published
II. 30% B Biodiesel trial underway
III. 35% of Staff participating in DCC cycle to work scheme to date
IV. Over 300 litres of used cooking oil collected in 2009 by Fire Stations Crew.

FUTURE ACTIONS

PHASE (III)

I. Report findings of 30% B Biodiesel trial and if successful,
II. Implement 30% B Biodiesel for all DFB and eventually 100% Biodiesel for all DFB
III. 100% staff participation in DCC cycle to work scheme
IV. Bioethanol Project on vintage car by Station Crew. This car will run on ‘Whey’ the by product of the cheese making industry
V. Begin Reporting on the wind energy provided from the new the Urban Wind turbines installed in Kilbarrack Fire Station. This excess free energy could be used to power the Delta District Officers Emergency Vehicle as transparent carbon offsetting. No carbon would be created using electricity provided from the National Grid.
VI. Pending result of wind energy analysis report, use wind energy to power all District Officer Emergency Vehicles in D.F.B.
VII. Pending result of Biodiesel trial, commence outreach educational programmes with local businesses, groups and schools.
SOCIETY

CONTEXT

COMMUNITY:
Over the last 150 years Dublin Fire Brigade has been providing the communities surrounding its Fire Stations with Safety and Protection. We also provide safety in the knowledge that we are there when an emergency happens. It is normal practice for DFB Fire Crews to interact with the local community of its Fire Stations by organising trips to National Schools, nursing homes, Youth Clubs and Sports Clubs to familiarise the children and adults with the service we provide and to inform them of Fire Safety in the home and work place. In Kilbarrack we have extended our role and have begun engaging the local community more. We have a Biodiversity Action Plan that includes local school children coming to our Fire Station and learning about sustainability and wildlife.

The Staff of the Station have built bat and bird boxes to give to the children for their schools along with vegetable seeds and compost from the Station. Staff and Management alike encounter no costs while taking part in these out-reach projects. As we move forward these small interactions could have large impacts on Dublin Fire Brigade.

A partnership has been formed between DFB and Oxfam for the year 2010. The aim of this partnership is to send 100% of our old uniforms and old civilian clothing to world aid relief projects.

INTERNAL COMMUNITY:
Dublin Fire Brigade has a total of 1045 staff and maintains strong links and connections with our retired members. We have developed what was formally waste land at the back of the station into a Commemorative Garden, to pay tribute to our members past and present. This garden is the first of its kind in DFB. A monument was commissioned and the sculptor has offered his work on the monument at no cost, as a token of his gratitude to Dublin Fire Brigade, for the service that we have provided over the years.

The basic concept of the monument involves the use of a strong column of Aberdeen red granite, symbolising that the Fire Brigade is an important pillar of our society. We intend this garden to be an area of reflection where by the retired and grieving members can come and go and still be part of the Fire Station although they no longer work there. Our retired members have been involved in this project from the start and have invested a lot of their time helping with the construction of the garden and the grounds work for the Station. There has been no cost to DFB for their effort.
ACTIONS

PHASE (I)
I. Commence outreach projects: such as donating Televisions and DVD Players to local clubs
II. Study feasibility of collecting old uniforms and civilian clothing.
III. DFB Retirement Committee involvement in the planning of the project
IV. Set up partnership with Oxfam
V. Consultations with Commemorative Monument Sculptor
VI. Begin staying as much as possible within the local area for food supply and delivery

PHASE (II)
I. Commence all ground works for commemorative garden
II. Commence all landscaping and planting and erect monument
III. Planting of Irish native trees
IV. Retired DFB members taking over the grounds keeping of the Station
V. Local National School children to help plant native Irish 20 year old Oak Tree in commemorative garden
VI. Open Commemorative garden with blessing from local Parish Priest
VII. Install Oxfam recycling receptacle for old uniforms and old civilian clothing
VIII. Construction of Bike Shed for Fire Stations Crew

ACHIEVEMENTS
I. DFB’s first Commemorative Garden for deceased members and present members completed
II. Many local communities out-reach projects implemented
III. The successful engagement and interaction between Station Crew and Retired Fire Brigade Members
IV. Old uniforms and old civilian clothes removed from Kilbarrack Fire Station have been sent directly to aid world aid relief.
V. The Commemorative Monument was donated to D.F.B. by the Sculptor, Mr. Phil O Neill as a gesture of thanks for the service we have provided to the county of Dublin
VI. Crew of Kilbarrack Fire Station have deconstructed the forty year old boiler and used its internal elements to create a modern art feature for the recreational garden
VII. Chief Fire Officer Mr. Hugh O Neill presented medals to the original and first Crew to turn out from Kilbarrack Fire Station. This medal giving presentation took place in Dublin Fire Brigade Sports and Social club
VIII. Respite days for the patients from the Local Hospice have been held in the Commemorative Garden.
IX. Over eight tons of waste steel produced from the retrofit work in the Fire Station have been recycled rather than being sent to landfill due the behavioural change by Station Crew. Also only three medium skip loads of waste actually sent to land fill for the entire Phase (I) and Phase (II) works
X. Local businesses and Landscaping firms have partnered up with Kilbarrack Fire Station, supplying gardening products and equipment regularly

XI. A coffee morning was held in the Fire Station to support one of the Stations Crew going to Africa to build a hospital. Over two hundred local people came to support the coffee morning.

XII. The innovation Dublin festival featured Kilbarrack Fire Station as a location to see transparent sustainable actions and projects that best represented Dublin in 2010. Over one thousand people attended.

XIII. D61 Fire Appliance responded to 51% less emergency turn outs on Halloween Night 2010 in the Kilbarrack Area, then on previous years.

FUTURE ACTIONS

PHASE (III)

I. Retired DFB members maintaining grounds of the Station
II. Biodiversity Action days with local National Schools
III. Visits to the Station from Local Retirement and Nursing homes
IV. Construction of two entrances to the Commemorative Garden using 100% recycled products
V. Reconstruction of the previously vandalised porch Entrance to Bram Stokers home in Fairview. This entrance has been donated to Kilbarrack Fire Station and will be used as the formal entrance to the Commemorative Garden
VI. Construction of a potting Glass house using 100% recycled products; built entirely by the Fire Stations Crew at no cost to D.F.B. Management or D.C.C.
VII. xChange Visions project. This internationally recognised Peace Project will be based from Dublin and will be sustainably governed using the seven themes of the Green Plan
VIII. Recognition Medals for first Fire Crew to turn out from Kilbarrack Fire Station by Chief Fire Officer Hugh O’Neill
IX. Construction of a Gymnasium for the Fire Stations Crew in April 2011. This gym will be entirely funded using the money ringfenced from energy savings created by the Phase (I) and Phase (II) projects. The Gymnasium has been designed by Neil McCabe and will be built to passive haus standards.
X. Jack &Jill foundation Partnership
PROCUREMENT

CONTEXT
Each week lifesaving fire and ambulance equipment was packaged and delivered to Kilbarrack Fire Station. On site this equipment was then de-wrapped and the consumables were bagged and put in the domestic waste bin for collection. There are four watches working in Kilbarrack Fire Station with ten Crew per Watch. Each day food used to be sourced from supermarkets by each mess man for each Watch on duty.

The combined Crew of the Station have committed to one person purchasing groceries locally, for the four Watches. This has reduced the amount of miles travelled to purchase the food and is helping with the local economy. An allotment is also under way to grow our own vegetables reducing food miles even further. We will also compost all organic waste there by removing the cost of buying fertiliser and compost and preventing the waste from going to land fill.

During the retro fit of the Station I have insisted, that the contractors doing the work, must use sustainably sourced materials, remove the waste that they create and that, where applicable, they must work with the local builder’s providers and use local suppliers. All material sourcing and labour must adhere to the Natural Step. We are committed to ensuring that all our actions in service delivery are implemented with a sustainable approach and consideration of knock on consequences to our greater environment.

The new waterless urinals don’t require bleach and environmentally harmful cleaning products. We would like to see these important sustainable changes considered in future Procurement.

Under local internal partnership DFB and DCC Joinery have teamed up to procure Sustainably Sourced Certified Irish Timber from managed Irish Forests. This timber is to be used to replace all aluminium alloy construction window frames, window panels, doors and door frames.

ACTIONS
PHASE (I)
I. Begin tender process with local builders, engineers, suppliers and architects
II. Begin tender process for Ambulance equipment and supplies with a Green Agenda
III. Commitment of Station Crew to open the mess among across the four Watches
IV. Reduce food miles and carbon emissions by sourcing food locally
V. Begin retro fit process on all projects and associated works with a Green Agenda
VI. Stop using bleach and chemicals on the urinals
PHASE (II)
I. Construct allotment Garden for the Station
II. Sow vegetables and plant fruit and herbs
III. Install 6m² Compost bay including a pig recycler for meats
IV. Audit the sustainable actions of the contractors involved in the retro fit
V. Construct a new window to be sited on the first floor of the Fire Station. This window will benefit from Solar Gain and will heat the new floor covering during the day. At night this floor covering will release the heat back into the Fire Station, lessening the demand on the Boilers and reducing the energy consumption of the Station

ACHIEVEMENTS
1. The tender process for Ambulance equipment and supplies has finished and a clear Green Agenda has been achieved
2. One person representing the four watches of the station now purchases groceries locally
3. A Green Agenda has been achieved with all the contractors involved the retro fit of the station. To date only three medium skips have been filled with waste and all other materials have been recycled including over eight tons of steel
4. Only Environmentally Friendly products are used to maintain the urinals
5. A 60m² vegetable allotment is now yielding crops
6. The local internal partnership between D.F.B. and D.C.C. Joinery Department has produced state of the art glazed units with a U Value of 8. These units are ‘A’ rated and have contributed to the Fire Stations U Value dropping by over 80%.
7. All seeds and vegetables have been grown and sown by two members of D.C.C Staff as a gesture of their interest in the benefits to the project
FUTURE ACTIONS

PHASE (III)
We would like to see an environmental audit on our supply change to ensure that all our external partners and suppliers will conform to a more sustainable and environmentally friendly tender and supply process. We also plan to build a 40m² extension to the Allotment for the growing of potatoes.

A Glass house is planned for the Allotment garden and will be used by D.F.B. members serving and retired as an area to sow seeds for the allotment. The entire project will be built from recycled materials all of which have already been sourced.

AWARDS RECEIVED
To date the Green Plan has received five awards:

1. The Green Awards – Winner of the Green Leader Award: Neil McCabe
2. The Lord Mayor of Dublin Award: Neil McCabe
3. The Green Apple Awards – Winner for Environmental Best Practice Award: Neil McCabe
4. The Green Apple Awards – Green Hero Award: Neil McCabe
5. The Lord Mayor Awards – Hidden Hero Award: Neil McCabe
APPENDIX

I. Glossary of terms
II. Matrix for three phases
III. Funding
IV. Partnerships
V. Green Plan history
VI. Aims of the Green Plan
VII. Research and explanation of Green Plan by Theme
VIII. European Directives
IX. How does human activity lead to additional green house gas production
X. Useful resources

THE FOUR WATCHES, KILBARRACK FIRE STATION.

A Watch

B Watch

C Watch

D Watch Appendix
(I) GLOSSARY OF TERMS:

DFB
Dublin Fire Brigade

DCC
Dublin City Council

IMPACT
Impact Trade Union

SIPTU
Siptu Trade Union

LANPAG
Local Area Network Partnership Advisory Group. This group provides support for workplace Partnership in each of the 34 Local Authorities in Ireland.

NEA
The National Energy Assessors Ltd. An independent, impartial energy assessor.

PST
Panels Solar Thermodinámicos. This is a new breed of Thermodynamic collectors, using aluminium plates.

BAP
Biodiversity action Plan

BIODIVERSITY
Is the interaction between organisms, ecosystems and variety of all natural life.

CYCLE TO WORK SCHEME
This is a DCC initiative to help reduce pollution and promote a healthier lifestyle.

BIODIESEL
Biodiesel is a clean burning fuel which runs in any unmodified engine. This fuel is an environmentally friendly alternative to higher emission petroleum diesel.

ENERGY MAP
Energy MAP is a support for organizations such as Local Authorities to develop an energy management programme.

CONDENSING BOILERS
Energy efficient boilers used in central heating systems.

SPACE HEATER
A former source of heat to the Engine Bay of Fire Stations.

LUMISAVR
An energy saving light.

PHOTOCELLS
A photocell is a resistor that allows current to flow more freely when light strikes

NATURAL STEP
Guiding principles on the concept of sustainability

CARBON CREDITS
Is a value placed on Carbon reduction as an offset of Green house gas emissions.

FOOD MILES
Refers to the distance a food product has to travel, from its production until it reaches the consumer.
GREEN PROCUREMENT
This offers a provision to become more environmentally sustainable through our tendering process.

AIRTRICTY
A renewable energy supplier.

SEEEMP

ENERGY MAP
Energy MAP is the Energy Management Action Plan from SEAI that provides a step by step guide to creating a best practise action plan for your business.

SEAI
Sustainable Energy Authority of Ireland.

GREEN AGENDA
An alternative approach to Greening Dublin Fire Brigade through our procurement system.

SUSTAINABILITY REPORT 2010
A DCC report that shows the practical benefits of moving towards sustainability.

DUBLIN CITY DEVELOPMENT PLAN
The Dublin City Development Plan provides the strategic framework and policy context for the sustainable development of the city.

GREEN HOUSE GASES
Greenhouse gases are gases in an atmosphere that absorb and emit radiation within the thermal infrared range. This process is the fundamental cause of the greenhouse effect.

COSAIN
Cosain, the Irish Efficiency and Emissions Initiative, is an Irish domestic carbon offset market. It will enable Irish firms and communities that abate emissions to generate domestic carbon credits, and subsequently sell these credits to other Irish businesses who are either unable to reduce their emissions, or where the purchase of domestic credits is a more economically efficient way of reducing their emissions.

CORPORATE PARTNERSHIP (CPF)
The role of the CPF is to have a shared ownership and responsibility for the change process within Dublin City Council in order to further develop high standards of public service by strengthening Local Government.
(II) TECHNOLOGY BY THEME MATRIX PHASE (I)

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### (III) FUNDING

Please see below the funding to date from the following organisations.

- Lanpag: €15,000
- DFB Sports & Social Club: €3,000
- Delite Energy Solutions Ltd: €2,500
- Dubco Credit Union Ltd: €500
- Botanic builders providers: €200

**Total to date**: €21,200
(IV) PARTNERSHIPS
DFB has entered into Public / Private Partnership with the following companies as part of the Green Plan project.
WEEE Ireland Ltd
Thorntons recycling Ltd
Oxfam International Ltd
Rehab Ireland Ltd
Recycling Village
Oxigen Limited
Prospect Gardens Ltd
Delite Energy Solutions Ltd
Mt Oils Limited
Cookstown Textile Recyclers Ltd
Irish Wild life Trust
DCC Parks department
DCC Water Conservation Office
DCC Joinery department
DCC Action at work
DCC Green Business Office
Jack and Jill Foundation

(V) GREEN PLAN HISTORY
The Green Plan is a flag ship project that began with local Dublin Fire Brigade partnership back in late 2006. It involves full station participation from all 36 Fire Fighters and 4 Station Officers in Kilbarrack Fire Station.

PARTNERSHIP IN KILBARRACK FIRE STATION
In April 2007, Kilbarrack Fire Station Crew established a Sports and Social Committee. This was in response to a surge of dissatisfaction by the Station Crew with the physical Station and its fabric. Partnership in the Station had at the time unfortunately collapsed and needed to be reinstated. This was due to a large proportion of personnel from Kilbarrack Fire Station moving out to the new Swords Fire Station when it first opened. Moral began to drop and the Stations Crew were becoming de-motivated.

The newly formed committee was made up of one Sports and Social and one Partnership Representative from each Watch. There are four Watches on duty in the station with a total of 40 Crew in the station. This figure consists of one Station Officer and nine Fire Fighters per Watch.
Neil McCabe was elected as the Partnership Representative for Kilbarrack Fire Station.

Neil outlined a rough plan of what he thought Partnership could bring to Kilbarrack Fire Station. “I realised that Partnership is a vehicle for progress and was aware that Partnership had achieved good results in the purchase of equipment and training of Dublin Fire Brigade staff over the years. I believe that Partnership can work and is a medium for staff in the station to talk and make changes”.

The members of Kilbarrack Fire Station discussed with their newly appointed Sports and Social / Partnership Reps, many key topics, the main focus being Station fabric refurbishment and modernization, the purchase of new sports and social equipment and a strategy for reducing the carbon footprint of the station. This strategy evolved into a large scale Project that Neil named the Green Plan. It was intended that if the Green Plan could work in Kilbarrack Fire Station then it could work in every Fire Station in DFB.

The Crew in Kilbarrack Fire Station started collecting used batteries. After only one month a large number of batteries had been collected rather then sent to land fill. Then the Crew started bringing recycling created in the Fire Station from its day to day running, to recycling centres on their own time in their own vehicles, after working the night shift. This shift in behaviour was one of the first building blocks of the whole Green Plan project.

Neil started increasing the amounts of waste prevented and reduced. He demonstrated that in Kilbarrack Fire Station there was a Shared Responsibility. Station Crew had decided that it was not good enough to dump consumable waste and have management pay for the cost of domestic waste created. Soon an entire strategy developed.

Neil was then introduced to Ms. Bevin Herbert, Dublin Fire Brigade Partnership Liaison Officer and Communications Officer. Ms. Herbert was and still is a great help in the execution of the Green Plan.

Neil began researching renewable, micro and alternative technologies for D.F.B. In most cases these technologies have not been used in Ireland before. Carbon Emission Reduction and lessening our impact on the environment was the ultimate priority. Neil introduced his research and the Green Plan to Dublin Fire Brigade Management, Partnership at local level and corporate level and finally at National level. Neil began running CPD Courses and giving presentations about what the Green Plan could potentially bring and how the energy consumption reduction could create actual savings that could be ring fenced and used to provide for even more projects and technologies. All work would have to be transparent and worlds best practices would have to be applied.

In Feb 2009 Neil got the go ahead and was given a budget for the Green Plan and was asked to implement the projects in Kilbarrack Fire Station.

(VI) AIMS OF THE GREEN PLAN

We have included world’s best practices and the most modern Sustainable Technologies as the backbone of our Green Plan. We aim to modify Kilbarrack Fire Stations envelope, fabric and grounds to achieve a Carbon Neutral status.

We aim to promote a greater understanding of needless energy and water consumption and wastage in Dublin Fire Brigade, Dublin City Council and our local community.

We aim to reduce the amount of domestic waste going needlessly to landfill.

We aim to make it as easy as possible for Staff / Crew to change attitudes and to make behavioural change towards sustainability. We aim to make the Segregation of waste as an everyday occurrence and making recycling part of all staffs’ everyday life as a shared responsibility.

We aim to have environmental auditing on our supply change to ensure that all our external partners and
suppliers will conform to a more sustainable and environmentally friendly tender and supply process.

We aim to reduce the Carbon emissions of our fleet of emergency vehicles by using Biodiesel and eventually fossil fuel alternatives including on shore micro wind generation.

We intend to use these aims to bring us closer to the vision for the Green Plan. This will lower the amount of Green house gases (GHG) that we are all responsible for creating and will lower the running costs of the Fire station at the same time.

(VI) EUROPEAN UNION DIRECTIVES

Under the Kyoto Protocol, ratified by Ireland in 2002, Ireland’s target is to limit annual greenhouse gas emissions to: 13% above 1990 levels by the period 2008 – 2012.

KYOTO PROTOCOL

As a result of the Kyoto Protocol the Energy performance of Building directive (EPBD) was established.

The objective of the EPBD is to promote the improvement of the energy performance of buildings, taking factors such as air-conditioning, the application of renewable energy sources and design of the building.

NON COMPLIANCE

Fines and sanctions for missing targets: The Commission proposal does not provide for mechanism to enforce compliance. However, Environment Committee MEPs stipulated that any Member State that fails to meet its target must pay an “excess emissions penalty” equivalent to the fines paid under the ETS – i.e. €100 per tonne of carbon dioxide equivalent emitted. All commercial buildings must be energy rated in accordance with (EPBD) by 2013. Buildings failing to have reduced their green house gas emissions will receive penalties. The proposed E.U. penalties / fines are €100 per ton of carbon emissions in 2013.

Member States should face strict fines and sanctions if they fail to meet national reduction targets for greenhouse gas emissions from sources that are not covered by the EU Emissions Trading System – e.g. road and sea transport, buildings, services, and farming – says the EP Environment Committee. In a vote on a proposed effort-sharing decision, MEPs backed national targets proposed by the Commission for 2013-2020, and called for these emissions to be halved by 2035.

The Environmental Protection Agency is warning that Ireland is facing a major challenge in meeting EU targets on reducing greenhouse gas emissions. In a recent report, the agency says the Government should be able to live up to its commitments under the Kyoto Protocol through the purchase of so-called carbon credits.

The EU, however, has set more ambitious targets to reduce emissions by 20% over the next 12 years. The EPA says Ireland will not meet this target unless stringent new measures are introduced to cut emissions.

(VII) HOW DOES HUMAN ACTIVITY LEAD TO ADDITIONAL GREENHOUSE GAS PRODUCTION?

Generally the sources of emissions can be broadly divided into two categories:

1. Energy related emissions arise through power generation, transport, industry, and buildings (heating and other fuel use).
2. Non-energy related emissions arise from agriculture, forestry, land use change and waste disposal activities.
Methane has a relatively short lifetime of 12 years. These long lifetimes in the atmosphere mean that emissions today will have an impact on the climate for the rest of this century and, in the case of some gases, beyond. The long life of these gases is one of the reasons that action on reducing emissions is so vital to prevent long term climate change.

The cycle of greenhouse gases are part of life on earth. However, it is the enhanced levels of emissions of these gases that are currently part of modern life which we need to address. If we are to effectively reduce current excessive emissions of greenhouse gases, fundamental changes are required in the way energy is produced and consumed, work is organized, leisure and travel and management of land and forests.

(VIII) USEFUL RESOURCES

- Conor Toolan – Biofuel in Ireland
- European Biodiesel Board (E.B.B.):
- Position paper on the proposals for a renewable energy directive (red) and a revised fuel quality directive: The contribution of Biodiesel to E.U. energy and climate change policies.
- Commission of the European Parliament: Tackling the challenge of rising food prices.
- Techno-economic analysis of Bio-diesel production in the EU: a short summary for decision-makers
- The Dublin Statement on water Water and Sustainable Development.
- The report “In dead Water: Merging of climate change with pollution, over-harvest, and infestations in the world’s fishing grounds.”
- The Intergovernmental Panel on Climate Change (IPCC) Report, 2007.
- European Environmental Bureau (EEB)
- Federation of Environmental Citizens Organizations.
- Met ÉIREANN: Climatological note no. 11 2008 Summer Rainfall in Ireland.
- Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Tackling the challenge of rising food prices.
- Directions for EU action.
- EBB Position paper on the proposals for a renewable energy directive (red) and a revised fuel quality directive.
- The contribution of Biodiesel to EU Energy and Climate change policies.
- Dublin City Council Green Business Office, Action at work publication.
- Dublin City Council Environment and Engineering Department, Water Services Division Publication entitled, Water is Precious Let’s conserve it.
- The Kyoto Protocol on Climate Change.
- Fact Sheet released by the Bureau of Oceans and International Environmental and Scientific Affairs.
- United Nations Framework Convention on Climate Change and Status of Ratification.
- Bioenergy News Document
- Volunteerism worldwide Ireland disaster volunteering programme.
- Grow Green Solutions.
- The Big Pig Composter information publication.
- EUROCITIES Working Group on Climate Change and Energy