

## THE MFB – REDUCING OUR ENVIRONMENTAL IMPACT

**Elaine Stewart**, Manager Corporate Compliance, Metropolitan Fire and Emergency Services Board.

Metropolitan Fire and Emergency Services Board, 456 Albert Street, East Melbourne, Vic 3002,  
[estewart@mfb.vic.gov.au](mailto:estewart@mfb.vic.gov.au)

This paper seeks to provide an overview of the MFB's commitment to the environment, its environmental achievements to date, challenges currently faced and how the MFB proposes to continue reducing its impact on the environment.

The presentation includes -

- Reducing our environmental impact is regarded as a critical aspect of the way we do business and an organisational priority impacting on all fire services across Australia.
- MFB aiming for a leadership role amongst fire services.
- Fire services have a high profile in the community; activities are visible and attract complaints if they negatively impact on natural resources – we have to demonstrate responsible practices.
- The MFB is aiming for an organisational wide commitment to better environmental practices – reduced water consumption, a reduction in greenhouse gas emissions, a respect for natural resources - it is a path that we have chosen and has not been forced upon us.
- We have started the journey; it will be dynamic and will not end.
- Our successes include
  - our new training complex (5 Star Green Star Certified Rating),
  - our newest fire stations,
  - strategic refurbishment program for other fire stations,
  - changing vehicles
  - changes to emergency response procedures
  - reducing the impact on the environment included as an MFB dominant strategy
  - appointment of scientific officers to attend incidents, analyse impacts and provide immediate advice;
  - recycling throughout the MFB, enhanced purchasing procedures, use of recycled paper, double sided printing.
- Our biggest success is improved environmental awareness across the organisation, an increase in conversations about the environment, and questions and suggestions being received from a large number of staff, operational and corporate.
- We have picked the 'low hanging fruit' it will become harder to initiate initiatives where there will be quick gains – in the future we will -
  - implement an environmental strategic plan going forward for the next generation of staff
  - tackle the challenge of reducing our footprint with vigour and determination;
  - continue to communicate our environmental priorities
  - continue to examine our skills in terms of sustainability and aim for new and creative fire fighting practices in the light of continued water scarcity
  - include environmental awareness in all training courses and business plans;
  - create a culture of environmental consideration and sustainability.
- MFB staff to be trained in water conservation measures and the MFB to research innovation in water conservation.

### Key Words

Environment; water, greenhouse gas, awareness, impacts, fire stations, vehicles, sustainability

## **INTRODUCTION**

I'd like to talk today about the MFB's environmental progress... our achievements, challenges, and plans for the way forward. At the outset I must admit that sometimes it's been two steps forward and one step backwards, but I am confident that with some well thought out strategies and the commitment of all staff we have begun our journey towards reducing our impact on the environment. I'll start off with some background information....

### **Drivers**

In 2001, the Victorian Government outlined its vision for making Victoria a stronger, more caring and innovative State. This was called 'Growing Victoria Together' and two of its goals were –

- Protecting the environment for future generations, and
  - Efficient use of natural resources
- These two goals included increasing the quality of air and drinking water, improving the health of Victoria's rivers, the reduction of water use and greenhouse gas emissions, reduction of solid waste and increase in recycling

Shortly after that, it was confirmed that Victorian annual rainfall was decreasing and that our greenhouse gas emissions were amongst the highest in the world. The MFB decided that minimising our effect on the environment was a key issue and that, as responsible citizens, we had to take positive action. We wanted to encourage and promote a spirit of environmental consideration throughout the MFB.

### **The Committee**

In 2003 we formed an Environmental Committee with members from across the organisation. The Committee was tasked with developing a Board environmental policy, consolidating existing initiatives and developing an organisational plan for the future. Four years ago, formal recognition of environmental issues had a low profile in the MFB so the committee was pleasantly surprised to find out how much was going on in the background. Our biggest challenges were probably finding out about current initiatives, getting staff environmental buy-in and encouraging behavioural change in all parts of the organisation.

With a few changes to membership, the Committee has continued. It has matured into a group of like minded enthusiastic people from all levels of the organisation. We have representatives from both corporate and operational areas, and are fortunate to have keen representation from the UFU as well.

We try and ensure that environmental considerations are included in all the MFB's activities, By including regular environmental articles in 'Firecall'; our in- house newsletter we provide information to staff on how to consider the environment both at work and at home. We also act as environmental watchdogs about things like unnecessary printing. We have, on occasions, made ourselves unpopular too. By replacing wastepaper baskets with recycling bins, and without advising staff, we forced people to walk to the kitchen or mess areas to dispose of things that cannot be recycled, like apple cores. Not a popular move!! We learnt to be more consultative, but continue to stir up conversations and increase environmental interest.

### **A higher profile**

All Committee members try to be available and approachable. One of the most gratifying measures of our success is the number of e mails with suggestions and comments received from many members of staff. Ken Latta, our new CEO now joins our meetings – with such support how can we fail?

Until a couple of months ago, the MFB had four dominant strategies: Building safer communities through emergency response and prevention; Engaging and developing our people; Strengthening our partnerships with government and the community and Excelling in leadership and management

In June 2007, a fifth was added – *Minimising our impact on the environment*.

We feel that this has really cemented our environmental commitment, as an organisation and as individuals.

## **OUR FIRE STATIONS**

### **Design and Delivery Manual**

The MFB has developed a ‘Design and Delivery Manual for New and Refurbished Fire Stations’. This is a practical guide to assist our Technical Services directorate in the delivery of new fire stations. It was intended for use with fire station construction, regardless of size, cost or complexity. A year ago the manual was updated to include energy performance improvements and integrated sustainability advice. This was our first concerted attempt to consolidate the experience and lessons learnt to date and provide benchmarks and targets for sustainability and environmental performance. The environmental objectives of the manual are to:

Provide an ‘intelligent’ building solution that will deliver:

- a) Lower building operating and lifecycle costs; and
- b) Improved environmental sustainability and achievable targets in areas such as energy, indoor environmental quality, water, materials and emissions.

It was agreed that all our buildings should exhibit a strong sense of environmentally sustainable design with the best use of passive and active energy conservation systems and practices. They have to be a home to our officers and firefighters, be durable, be an expression of their function (so that they look like fire stations, not factories) and be welcoming and accessible. We expect a fire station to have a life of 40 years, with at least one major internal refurbishment during that period.

We have recently completed our ‘Burnley Complex’ – a multi-use office and training facility, which was awarded a five star green rating from the Green Building Council of Australia. At a construction cost of \$40m, it was a huge project but because it isn’t occupied yet, I won’t talk about it but will focus on our fire stations.

### **Building sustainable new fire stations**

New fire stations are currently being built in Croydon, Port Melbourne and Footscray with a range of environmentally sustainable design principles guiding their construction.

These include –

- Orientating living areas, wherever possible, to the north for winter warmth from the sun and to reduce the need for heating
- Double glazed windows with high performance glass, with timber window frames, which provide better insulation than aluminium
- Installing energy saving measures such as solar boosted gas fired hot water systems and energy efficient appliances
- Automated lighting systems using high performance lights with very low energy levels
- Providing all habitable areas with thermostatically controlled air-conditioning units. Low level windows that can be opened are also provided to allow cool air to enter the room, with reed switches fitting to the windows so that the air-conditioning is turned off automatically when the windows are opened

- Installing motorised sunshades outside thermal chimneys and closing the windows whenever refrigerated cooling is used.
- Solar hot water, rainwater harvesting for irrigation and toilets and low water consumption fittings and fixtures

### **Improving our existing fire stations**

When we refurbish fire stations we are committed to optimising our assets, reducing greenhouse gas emissions and implementing water conservation targets. A basic refurbishment would typically reduce carbon emissions by 15% and water use by up to 26% by -

- enhancements to the air conditioning to incorporate economy cycle and improved lighting control
- water efficient plumbing fittings and sanitary ware, solar hot water and water tanks for gardens and station maintenance
- double glazed windows
- enhanced shading
- review of insulation, including door, window and gap sealing

### **Emissions**

However, in spite of all our efforts to make our buildings as efficient as possible, we are finding it a challenge to reduce our greenhouse gas emissions. New requirements such as clean and dirty areas, a separate bedroom for each firefighter and more bathrooms mean that fire stations while more efficient, are larger.

Positive behavioural change is probably as big a contributing factor as building improvements, so we are focusing on behavioural change as well. Modelling has shown that our greenhouse gas output should shortly level out, before starting to decline.

## **WATER**

### **MFB Sustainable Water Management Strategy**

With the recent droughts, and water restrictions affecting everyone's daily life, it is not surprising that water conservation has become a very important issue. For several years now, our building upgrades have included water efficient sanitary ware and the installation of water tanks.

With the increased levels of regulation and public demand that sustainability be prioritised, our Facility Services Department decided that the time had come to do a thorough investigation of water efficiency so that we could update our thinking on water saving measures. We also wanted to use the latest data and technology available. So, we developed an MFB Sustainable Water Management Strategy with new Proposed MFB Water Management Standards.

The Strategy considers every aspect of water use at fire stations, starting off with plumbing fittings inside the station and progressing through the use of grey water, rain water collection, to the type of flora that we should be planting in fire station gardens, and the best type of mulch to use.

This investigation began by consideration of the WELS Scheme. This is the Water Efficiency Labelling and Standards Act 2005 Scheme which is a joint initiative of the Australian, State and Territory governments. It's similar to the energy rating labelling with six stars. The more stars the better. The labels also show a water consumption or water flow figure. WELS replaced the previous labelling scheme (the one with all the As) from July 2006 and applies to all showers, taps and toilet fittings.

We have estimated that by installing the latest water efficient shower head we could save about 14,000 litres per year per shower unit. A flow on saving would be a reduction of about 47% in gas water heating costs.

We have installed underground water tanks at 4 fire stations to capture storm water from the car park areas and from operational drills so that we can reuse water. Initially we planned to install rain water tanks at fire stations progressively, as these were refurbished and intended to install tanks all sites over period of five years.

Because of the impact of water restrictions, a desire to optimise water consumption, and many requests from operational staff, we have fast tracked this program and are hoping to have tanks installed at all 49 fire stations within the next year.

### **Consumption**

We have recently purchased software for monitoring water consumption. Water consumption data for all fire stations and offices over the last three years has been entered into the system, and we are currently analysing the data and correcting anomalies. We have seen that, through the efforts of our staff, water consumption has been steadily decreasing and we hope that if staff know how much water has been used or saved it will encourage them to continue conserving water and give them some positive feedback. The program can also send automatic notifications if there are abnormal deviations in consumption. This will alert us to things like problems with the metering equipment, or water leaks.

We anticipate that within the next few months the system will automatically send consumption data to each fire station as accounts from the water utilities are received. It is not easy for staff to continue to conserve water, unless they can see the proof of what they are doing.

### **Recycled water**

The MFB has undertaken a joint project with the CFA progressing the use of recycled water for firefighting. Our joint position is that we support the use of Class A recycled water; with the use of recycled water below class A only to be used in emergency situations where no alternative water source is available. Class A is classified as recycled water suitable for garden watering and toilets, agriculture (direct contact with some crops) and firefighting.

The MFB is not directly impacted at this stage. There are housing estates with recycled water in the CFA area, but there is the chance of MFB staff responding to incidents at these estates when we 'step up' into CFA areas.

Information and training packages and standard operating procedures have been developed with the CFA, and information sessions run for relevant fire stations.

We have also started using water from certain areas of the Bay for drills and practices. This means that we have to flush equipment after the drill using fresh water to prevent corrosion. We have identified specific fire stations as sites where we collect rainwater and which are suitable for flushing equipment. The water used for flushing will be collected and recycled.

### **Our water pods**

This is a really 'good news' story and should prove to provide incredible water savings...

We are currently trialling a water pod for training and drills. The pod has a capacity of up to 15,000 litres and is filled up from the mains. The water pump simulates the action of a street hydrant and firefighters have to adjust the pump for the relevant operating conditions. Previously, during a 4 day drill we could use up to 4 million litres, but because the water in the pod is recycled consumption is

reduced to the capacity of the tank. After eight days of drills, the pod is emptied and the water recycled elsewhere or donated to local councils for use in parks and pavements. If the trials are successful, the MFB intends to purchase a further three pods, so that we have one for each zone.

## **Water Restrictions**

We have received exemptions from water restrictions from the water utilities. Operational staff have been advised that they can use water, by the most efficient means, for drills and decontamination and for washing appliances when necessary for staff safety. It's really difficult to set firm rules for things like these, so we've said to staff that they should use their common sense, always considering the community's perception.

## **OUR FLEET**

### **Strategic Fleet Improvement Plan**

The MFB's fleet comprises 113 appliances and almost 200 passenger vehicles, which, in total travel about 5.5 million kms a year. Last year we used almost 1.2 million litres of fuel.

We have a strategic fleet improvement plan which focuses on exhaust emissions, servicing waste, life cycle environmental impacts and noise emissions.

The strategy includes –

- Improved heavy vehicle emission standards are to be taken up as soon as commercially available as opposed to when required by legislation.
- Fuel efficiency is now an important consideration when passenger cars and light commercial vehicles are purchased. Hybrid vehicles are used as tools of trade when appropriate and incentives are provided for executives who make environmentally friendly choices, such as four cylinder cars or hybrid vehicles
- Investigations into the reduction of waste generated by vehicle servicing, such as the use of environmentally friendly long life coolants, the use of synthetic engine oil to remove the need to change oil at each service and a review of air filter maintenance.
- Removal of underground fuel tanks
- The reduction of noise from appliances which is an OH&S issue as well as an environmental one.

One of the biggest challenges for our Fleet Department is the reduction of vehicle reliance and usage. This can be encouraged by the promotion of car pooling, teleconferencing and the use of public transport, but the biggest hurdle will be behavioural change. We're also going to have to consider our response arrangements – do we really need to send two appliances through rush hour traffic to attend to a smouldering cigarette in a bin?

## **OPERATIONAL ISSUES**

More structured methods of firefighting, using sectors; incident controllers, etc. provide better information for crews and assist more effective fire fighting.

Task force tips are fitted to hose lines, equalising pressure in the hose which avoids overloading at branch pipes and assists a more efficient use of water

I'd like to discuss now the impact of our operations on the environment. We know that –

- Fire water run off, wetting agents and foam can pollute water and have an impact on biodiversity
- Chemical spills or leaks can pollute soil, water and air and the disposal of waste materials has to be carefully considered

- Smoke from structural or chemical fires can cause air pollution
- Decontamination procedures can pollute local waters; and
- Water, a scarce resource, is liberally used during incidents and training

## **POLLUTION**

### **Air pollution**

The type of smoke given off from a fire can vary depending on the type of material burning and the how the fire is fought. Sometimes, letting the fire continue to burn has less environmental impact than extinguishing it, because during combustion some hazardous materials are converted to less harmful substances, such as carbon dioxide.

However, the community expects that fires are put out as soon as possible. At larger incidents we carry out atmospheric monitoring so that local communities can be warned of dangers posed by resultant smoke.

### **Water pollution**

The runoff from small fires is usually has a short term detrimental effect on local aquatic ecosystems. However, larger fires which involve chemicals, rubber, etc., may cause long term damage to waterways.

It is difficult for the MFB to contain fire water, especially when incidents are large and protracted. The best strategy is to minimise the amount of water used by having an efficient fire fighting strategy, and to contain the water that has been contaminated with unburnt products.

Fire retardant foam can have a detrimental affect on local waterways. The chemicals can dissolve in the water column, and become available to local water life. The best way to reduce our impact is to minimise the use of foam and contain water and foam so that it is unable to enter waterways.

During decontamination we use copious amounts of water. Usually, decontamination is not an environmental issue because of the amount of water used. However, the water runoff from decontamination showers can be more concentrated. If our scientific officers consider that this may impact on the environment it is tested and treated before it is released into the environment.

### **Soil Pollution**

Soil contamination doesn't usually need urgent attention because if liquid contaminates the soil, it doesn't go anywhere. We still need to consider soil contamination as part of our response, however. Eventually contaminated soil will need to be dug up and removed and disposed as waste at another location. It will also to have to be replaced with clean fill, which could have been used elsewhere.

### **Hazmat Incidents**

The MFB has two scientific officers who respond to all hazmat incidents of third alarm or higher. We have recently run a hazmat technician's course for 80 operational staff so that we have a larger pool of knowledge amongst staff who initially respond to hazmat incidents. Their two week course included practical incidents and theory. Covered in the course were theory components such as decontamination, atmospheric monitoring, dangerous goods, CBR response and physical and chemical properties. Most of our new hazmat technicians will be based at one of two dedicated fire stations, where we keep a cache of equipment for responding to hazmat incidents.

We are confident that having so many staff with an enhanced knowledge of hazmat incidents and an appreciation of the environmental dangers posed by such incidents will help decrease our impact on the environment.

The MFB, as a member of AFAC's Environmental Management Working Group, is developing best practice guides, procedures and training materials to enable fire services to minimise the environmental impact of incidents involving hazardous materials.

## **GENERALLY**

### **Recycling**

All sites and every office have fully co-mingled bins. These are used for the disposal of paper, plastics, glass, cans, etc. Over 90% of paper purchased is 50% recycled paper and most printers default to double sided printing. Empty printer cartridges are recycled.

### **Reusing**

The MFB and its staff support a number of foreign aid organisations by donating excess and decommissioned fire fighting uniforms and equipment. There are even orang-utans in Borneo swinging around on our old hoses. Closer to home, we donate pre-used computer equipment to a not-for-profit organisation for the benefit of disadvantaged Australians.

### **TravelSmart Program**

We are encouraging employees to participate in the Victorian Government Travel Smart / Green Transport Program. This aims to reduce people's reliance on cars and encourages them to consider alternative travel such as public transport, cycling and walking. Initiatives implemented during the past year include:-

- Providing employees with annual discounted public transport tickets which are paid for by salary deductions
- Issuing odometers/pedometers for employees prepared to make a positive change to their commuting arrangements
- arranging with a local provider for discounted service charges for bicycles
- making tram tickets for official travel and umbrellas for inclement weather available at the head office reception desk.

### **Innovation**

The MFB in partnership with Sustainability Victoria is implementing an innovative solar energy saving initiative at fire stations.

A \$144,000 grant, part of the Victorian Solar Innovation Initiative program, was received to fund the development of three initiatives that will contribute to the reduction of greenhouse gases at fire stations.

Various solar innovations are to be incorporated into the MFB's fire station refurbishment programs, such as thermal chimneys to provide passive cooling, photovoltaic panels to act as light shelves and solar collectors to create solar hot water heating systems.

The MFB will continue the ongoing development of further innovative solutions for facilities that can be used by other government agencies in their attempts to reduce greenhouse gas emission levels.

## **The way forward**

Last year, the Environmental Committee engaged an environmental consultant to examine our environmental progress, compliance, our impact on the environment and to consider the use of an environmental management system. It was an extensive exercise and the consultant conducted more than 100 hours of interviews with staff, visited some of our fire stations and other facilities, and reviewed many of our documents.

There were many positive findings, including that there was a high level of environmental commitment by senior management, our housekeeping on sites visited was generally sound, containment measures used at fires and other events were good and that the engagement of scientific officers who were available 24/7 was a sound move.

There were also major non-conformances like inadequate statutory reporting, unknown extent of onsite soil and groundwater contamination and multiple examples of using resources like energy and water inefficiently.

We are using the consultant's findings to develop an organisational 'way forward'. We have recently employed an environmental manager, for an initial period of a year. We are looking forward to the contribution that can be made by a dedicated person who has the time, passion and knowledge to concentrate on the environmental challenges faced by the MFB.

## **Conclusion**

One of the benefits of our environmental initiatives is that they have involved the entire organisation and have required commitment from top management and staff alike. We have also seen how a small, dedicated and enthusiastic committee can make a difference within the MFB. Teamwork displayed by our members has provided us with tangible and important benefits.

We have made good progress over the last four years. We started off by picking the 'low hanging fruit' for quick gains, and increased awareness. It's getting harder and harder to find these, and we will have to concentrate on longer term projects, whilst continuing to communicate with staff and encouraging behavioural change.

We'll have to carry on looking at what we do, investigating options and implementing improvements, so that environmental consideration is a way of life and incorporated into everything we do, both at work and at home.

We have had many conversations about environmental issues faced by fire services, both formally and informally – as part of the AFAC Environmental Management Working Group, at environmental conferences, and during our day to day interactions with Australian fire services. It is clear that all fire services are facing similar challenges – scarce resources, public scrutiny of and interest in our activities, and compliance with government policies and directives. We should continue to work together and share our experiences and strategies.

We're also trying to enhance our environmental relationship with our Victorian neighbours, the CFA, by sharing knowledge and trialling initiatives in partnership with them.

We are sure that with persistence and dedication we will reduce our impact on the environment. We are privileged to be held in high regard by the community and do not want to be seen by future generations as having betrayed that trust by being poor custodians of the environment.