



Cooling our planet one backyard at a time

Environmental Solutions from the Horticultural Industry



**Nursery & Garden Industry
NSW & ACT**

Photo courtesy of Royal Botanic Gardens Trust,
Photographer: Jaime Plaza

Climate change
and our response
to it will define
our generation.

There is no
stepping away
from it.

Cooling our planet one backyard at a time

With the recent release of the Garnaut report, the focus on looming climate change has suddenly been brought to the attention of mainstream Australia. Whilst the Federal Government grapples with the implementation of the policies laid out in a stark and dramatic form in the report, the day to day degradation of our urban forest is causing damage to the environment in which we wish to live. Extensive studies have been conducted overseas on the urban 'heat island' effect and the effects of evapotranspiration. In the face of such knowledge we can, here in Australia, form policies that will counter the diminishing urban forests because if we do not move now, our inaction could itself compound the later consequences.

The Nursery and Garden Industry NSW & ACT (NGINA) is committed to working closely with NSW & ACT Government departments and agencies together with the Nursery and Garden Industry Australia (NGIA), the peak horticultural industry body, to promote the "Our Environment, Your Backyard" and "Cooling our planet, one backyard at a time" promotions.



Ulmus parvifolia Avenue

Specifically the ideals will be:

- Reduce household energy consumption through efficient garden design.
- Reduce the heat island effect by improving the urban forest through evapotranspiration.
- Reduce pollution and increase carbon absorption.
- Assist householders to reduce their carbon footprint.

Concerted co-operation amongst all stakeholders to improve our local environment will lead to a better quality of life in urban areas for future generations.

I urge you to give earnest consideration to this document.

Mike Mehigan
President, NGINA



Nursery & Garden Industry
NSW & ACT

Nursery & Garden Industry NSW & ACT P O Box 3013 Rouse Hill NSW 2155
Tel: 02 9679 1472 Fax: 02 9679 1655 Email: info@ngina.com.au Website: www.ngina.com.au

STRATEGIES

The strategies listed on the following pages are divided into short (1-3yr), medium (3-5yr) and long term (5yr +) effects-based proposals. For medium and long term effects to be achieved in the timeframes, work would need to commence shortly after the project commences due to longer lead times in regulatory reform or growth patterns.

WATER

NSW & ACT gardeners have now lived with water conservation measures for 4 years and have understood and accepted the need to conserve water. Water consumption in the home and garden has dropped dramatically, to the extent that home gardeners have achieved significant savings in water usage.

Home gardeners have embraced new watering methods and technology. Rebates for the installation of water tanks have been well received. Conversion of spray to dripper irrigation systems and the use of water conservation products and garden mulch has reduced water consumption, whilst allowing continued maintenance of gardening standards. The use of water on the urban forest will continue to create a dynamic tension between availability and benefit.



*Mt Annan Water Garden, Photographer Simone Cottrell
Photo courtesy of Botanic Gardens Trust*



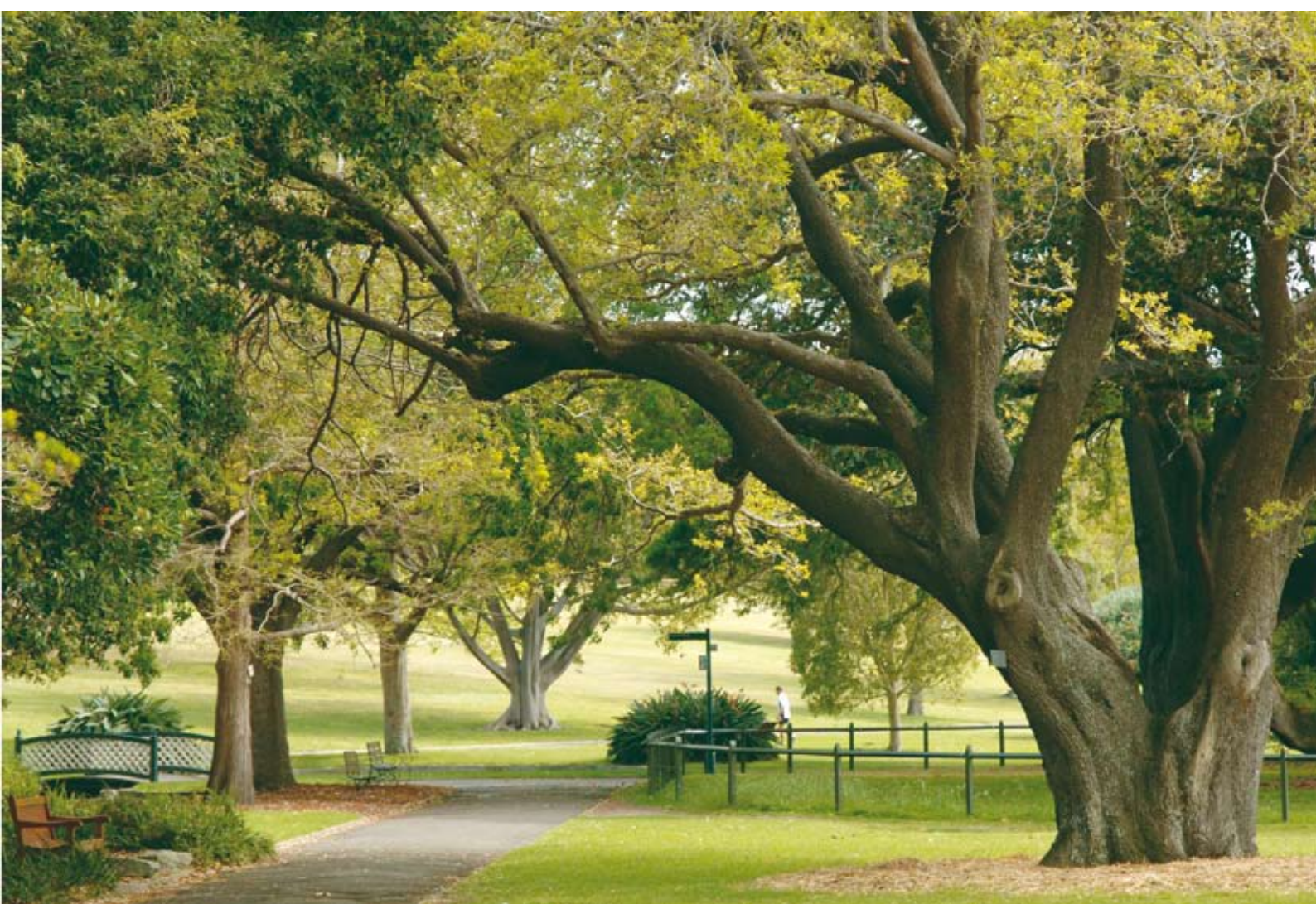
*Steps in Autumn, Photographer Jaime Plaza
Photo courtesy of Botanic Gardens Trust*

THE HEAT FACTOR

- Cities can be 5°C warmer than the surrounding countryside during summer.
- There may be substantial increases in electricity consumption over the next few years due to refrigerated air conditioners alone. Most modern house design ignores the value of wide eaves to shade the home, thus increasing the reliance on air conditioning.
- Due to the consolidation of our cities, where there has been a reduction of green spaces, smaller plots, paved backyards etc., the urban 'heat island effect' has caused the ambient temperatures to increase. Paving, dark coloured surfaces and roofing absorb the sun's heat thus encouraging the dependence on air conditioning.
- The urban forest is under threat and reducing in size mainly due to poor urban design and government pressure to increase housing availability within city boundaries.
- There seems to be a haphazard and uncoordinated approach to an urban planting program.

THE COOL FACTOR

- Trees and vegetation have the ability to lower temperature by providing shade through canopy cover and through a process referred to as evapotranspiration.*
 - * *This process combines evaporation and transpiration to lower temperature by using heat from the air to evaporate water. Evaporation occurs when water in soil and intercepted on leaves and other surfaces during rainfall is converted from liquid to gas. Transpiration is when plants absorb water through their roots and secrete it as a vapour through pores in leaves.*
- Shaded walls and roofs may be 5-20°C cooler than similar surfaces in unshaded areas. These cooler surfaces reduce the heat transmitted into the buildings, thus reducing the dependence on air conditioning and lessening the 'heat island'* effect.
 - * *An urban heat island is a metropolitan area which is significantly warmer than its surroundings. The main cause of an urban heat island is the modification of the land surface by urban development. Waste heat generated by energy usage is also also believed to be a contributing factor.*
- An increase in tree canopy cover could significantly reduce annual cooling costs.
- Trees planted in urban areas can sequester significant amounts of CO₂ annually, depending on their size and growth rate.



**A view of the gardens, Photographer Jaime Plaza
Photo courtesy of Botanic Gardens Trust**

A PLAN FOR THE FUTURE

Future generations will condemn those who missed the opportunity to set in place strategies that would address the serious environmental issues challenging us. The time to make plans for the present and future is now, without any further prevarications.

Detailed here are some strategies that should be implemented in short, medium and long term planning. Realistically, the medium and long term proposals would have to commence soon after the short term proposals are underway. It must be understood there would be some quite substantial lead times to implement some of these strategies.

The Urban Forest is defined as the total cover count of all trees and significant sized shrubs which are growing on public and private land within defined urban areas. This is measured as a percentage of the total canopy cover for the defined area.

SHORT TERM

EFFECT 1.1

Protecting the Existing Urban Forest Community

- A householder rebate to install dripper irrigation systems for home garden irrigation. This should be linked with Smart Approved Watermark products and services such as hoses, tap fittings, grey water systems, rain sensors, etc..

Local Government

- Initiate a dialogue with local councils to ensure a strategic plan is in place that conserves local parks, gardens and street trees. It is a known fact that a neighbourhood with plenty of mature trees can be significantly cooler than less canopied areas.



Typical suburban streetscape



*Central Avenue, Domain, Photographer Jaime Plaza
Photo courtesy of Botanic Gardens Trust*

- Work with local governments to obtain grants to install recycled or alternative water sources and to maintain public garden spaces.
- Encourage Local Governments to produce community education material - leaflets, web access, forums, etc. that outline the urban forest project and the benefits of trees within the community.

An urban area that has a well maintained and aesthetically pleasing tree canopy will in many instances lead to a community that has a lower crime rate and has a better feeling of wellness.

EFFECT 1.2

Expanding the Urban Forest Community

- A rebate plant voucher to encourage greater gardening awareness for new home owners.
- A brochure printed for distribution through retail garden centres with a strong 'Benefits of Tree Planting' message. Advice would include that trees reduce summertime cooling costs and that the use of deciduous trees would be doubly beneficial by allowing winter sun through to warm the house.
- Trees and shrubs planted within the vicinity of the house will assist in reducing the heat island effect.
- An annual Community event to be staged whereby the environmental importance of the urban forest is showcased. Tree planting activities could be included, e.g. free trees to householders, community gardens enhanced/encouraged, industrial areas improved with trees, school gardens upgraded. There would be so many aspects in which the community could become involved during one week's activities.
- In more rural areas land rehabilitation could be encouraged together with a focus on green spaces.



Tawny Frogmouth Owls, Limpinwood Gardens Nursery, NSW

Government

- An audit of public land which will highlight areas that are suitable for mass tree plantings for environmental benefit. A review of any government policies that relate to roadside tree plantings.
- Ensure that government agencies understand the benefits of certain tree species which have proven to be ideal in assisting in the reduction of city pollution. Trees such as the Platanus are reputed to be excellent in absorbing polluted air and thus assist in improving the air quality.
- Manage a tree replacement program to ensure that old or diseased trees are replaced in such a way that there are always young healthy trees replacing the older ones. Trees to be planted that are sympathetic to the local community and environment.
- To create a sense of diversity in the urban tree afforestation program by planting a variety of Australian native and other hardy non-native tree species.



*Photographer Jaime Plaza
Photo courtesy of Botanic Gardens Trust*

EFFECT 1.3

Home Food Production

It is widely accepted that Home Food Production, the 'Grow Your Own' concept, is healthier for families and the produce tastes better. Research is now showing that 'Growing Your Own' could assist in reducing the householder's carbon footprint.

'Food Miles' is a phrase that is now being used and questioned by the public. This is the commonly used term to measure how far food travels from source to the end user i.e. from 'paddock to plate.' From this it is an easy task to see how environmentally friendly the food is.

Food freight is a huge component in the cost of the product. Air and road freight is costly and consumes vast quantities of fuel, releasing greenhouse gasses and affecting the global climate. A simple analogy is that 'the lower the food miles, the better the product is for the environment.'

Air-freighted fruit and vegetables is a bad habit that supermarket chains have cultivated amongst their consumers. The demand for 'out of natural season' produce that is now available year round ensures that we can eat whatever we like whenever we want, but at what cost?

- Food Miles is a highly emotive subject as the whole 'Grow Organic' concept gets drawn into the debate as well as the fact that several food types just do not grow or get produced in certain countries.



Photo courtesy of MacBird Floraprint



Photo courtesy of MacBird Floraprint

There is one indisputable fact that runs through this whole 'argument' and that is, when we 'grow our own' we will reduce our greenhouse gas emissions because:-

- Non-renewable oil is used to till the soil, plant the seed, weed and harvest the crop and then transport it to storage. Bear in mind through all of this the rapidly rising costs of oil and its eventual scarcity.
- Electricity is used to process the crop, package and refrigerate it and provide supermarket facilities – lighting, heating etc.
- Oil is the energy source used to make fertilisers, weed killers and pesticides to grow the crops and finally
- The consumer will invariably drive several kilometres to the shops to purchase these items, once again using non-renewable oil. This should lead to the inevitable slogan:

**“HOME GROWN FOOD
BETTER BY MILES”**

EFFECT 1.4

Public Education Program – Cooling our planet, one backyard at a time

- Initiate a Public Education Program in addition to Gardening Shows and other similar opportunities, to educate the public on the Heat Island Effect, the benefits of the 'Urban Forest', the 'Home Grown Food – Better by Miles' concept and the 'Cooling our planet, one backyard at a time' philosophy.
- A Schools Based Education program that could link in with the National Tree Day planting program and World Environment Day.
- Collaborate with the NSW & ACT Governments to set up a State and Territory based Urban Heat Island Initiative. This would encourage local councils and departments to implement comprehensive Urban Heat Island Policies. Some examples could be:
 - Encouraging the establishment of city rooftop gardens. The 'Greening of the City' project in Chicago, USA is leading the world in this concept.
 - Ensuring a minimum percentage of green space is allocated to urban and city planning.
 - Establishing grass and gardens in lieu of unused hard paved areas wherever possible.



Children are our future

MEDIUM TERM

EFFECT 2.1

Cool Roof Strategy

- In conjunction with the NSW & ACT Urban Heat Island Initiative, to develop a 'Cool Roof Strategy'
- As highlighted in Effect 1.4 of the Short Term Strategies, new developments in rooftop gardening technologies are available whereby vegetation is planted on roofs. This reduces the Heat Island Effect and lowers energy consumption within the building. An added benefit is that it improves the aesthetic appeal of large city structures and also benefits the occupants who can use the rooftop green spaces for leisure and recreation.

Industrial buildings, high rise residential and commercial offices are all suitable for the 'green rooftop' program.

EFFECT 2.2

Energy Rating

The current energy efficient home and business rating system does not appear to recognise efficiencies in energy saving landscapes and garden designs.

- In consultation with Australian Institute of Landscape Designers & Managers (AILDM), NGINA would initiate guidelines for tree planting around new homes and businesses.
- A selection of suitable trees per building site with the aim to reduce the ratio of hard landscaping to soft landscaping. If this criterion is met, then a 6 star rating would be approved.
- With regard to businesses, as an incentive, participants who receive a NSW & ACT Green Building Certificate may use the logo and be recognised appropriately.

It is of paramount importance that parking areas for commercial zones and shopping precincts should contain at least 50% tree shade covering – these zoning requirements are being adopted in Europe and the USA.



*The Boardwalk, Photographer Jaime Plaza
Photo courtesy of Botanic Gardens Trust*

EFFECT 2.3

Improving Tree Canopies in Parks and Public Gardens

- State Government matches dollar for dollar on conversions and new works infrastructure to install recycled water systems for parks and public gardens.



*Picnic area, Mt Annan, Photographer Jaime Plaza
Photo courtesy of Botanic Gardens Trust*

LONG TERM

EFFECT 3.1

Expand NSW & ACT Urban Forests Target

Trees will sequester and filter carbon during their lifespan. Assuming a progressive tree planting program is enforced, then annual carbon sequestration rates would raise significantly.

A tree planting target should be set with realistic and achievable goals. It could be planned that NSW & ACT set a target of 5 million trees planted by 2020. Targets would be reviewed and revised annually.

All levels of Government must understand the importance of this tree planting program and the long term benefits it will have on the community.



*Spring Walk, Photographer Jaime Plaza
Photo courtesy of Botanic Gardens Trust*

CONCLUSION

The Urban Forest has largely been ignored over the past decades in NSW & ACT. Successive State and Territory Governments have overlooked the significance of the Urban Forest and how it can assist in the reduction of energy costs and carbon emissions. These, coupled with associated health and well being benefits to the community, are vital for future policy planning.

Climate change and all the ramifications of this all encompassing topic is an issue that lies at the very core of our society's future. The NGINA firmly believes that it can play a vital and important role in planning for the future.

The strategies discussed within this document will empower NSW & ACT residents with sensible solutions that will have a positive and beneficial effect on climate change.

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ACKNOWLEDGEMENTS

- Peter Whitehead, CNP, NGINA • Anthony Kachenko, PhD, CNP, National Environmental & Technical Policy Manager, NGIA
- Monique Lulan, NGINA • Nursery & Garden Industry Victoria

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our planet**

**one backyard
at a time**

our environment, your backyard

Life is a garden.



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