

# think --- act

what legacy will you leave?

## contents

|    |                                                         |    |                                                           |
|----|---------------------------------------------------------|----|-----------------------------------------------------------|
| 01 | introduction                                            | 23 | other methods of carbon offsetting                        |
| 02 | holistic planet overview                                | 25 | the problem of carbon neutrality                          |
| 05 | impact of industry                                      | 26 | forestry accreditations                                   |
| 11 | population growth                                       | 29 | Environmental Management Schemes and other certifications |
| 13 | the role of industry in emission reduction              | 30 | recycling                                                 |
| 14 | how the printing industry has adapted to climate change | 36 | life cycle analysis                                       |
| 17 | perceptions of the printing industry                    | 39 | the good news                                             |
| 19 | offsetting emissions                                    | 42 | the changes at Southern Colour                            |
| 20 | reduction not offsets                                   | 44 | suggested reading                                         |
| 21 | trees as carbon offsets                                 |    |                                                           |

## about the author

Phillip Lawrence has been actively involved in the world wide printing industry for more than 35 years across a number of areas of the sector. The experience he has gained traverses ink making, pre-press technologies, quality control and efficiency, printing machinery, papermaking and advertising. During the past eight years Phillip has engaged in academic study at the University of Technology, Sydney where he has been exploring how the 1,000 year old printing industry has responded to society's concerns about the damage being done to the natural environment. Phillip has recently completed a Master's research thesis and is working towards a PhD in this field.

Phillip started the consulting firm Eco Logical Strategies in 2008, where he works with a number of companies both locally and internationally on issues around how commercial organisations fit into the aims of political environmental policies. Most of Phillip's work is focussed outside of Australia. His research and experience make him a respected resource assisting firms striving to address environmental issues.

As an organisation, Southern Colour illustrates how Phillip sees firms addressing environmental issues within the industry. Phillip views Southern Colour as a prime example of how a firm can develop a successful competitive

business strategy in a period of ecological uncertainty. Rather than taking a grim view of how the world is going to deal with the spectre of climate change, many scholars believe we are entering a period of great opportunity, which will result in a change in the way business is conducted. The world is shifting away from a singular monetary focus. A carbon-based economy forces firms to account for the damage they are doing to the environment; carbon is a measure of business efficiency. Southern Colour is engaging in a process of direct and indirect environmental activity which will position them extremely well within this future carbon economy.

## introduction

The term sustainability has taken on an entirely new definition over the past decade. For the first time ever global man has faced a truly intergenerational issue. How we collectively address the issue of global climate change is not necessarily going to have any direct impact on the environment we live in today, but it will be critical to future generations. Our children and grandchildren will be the ones that benefit or suffer depending on how we address our environmental problems today. This intergenerational sustainability simply means that we need to take responsibility for the damage that industrial man, 'Homo economicus' has caused to the Earth. In taking such responsibility we should do everything we can to reduce the damage we do to the environment and where possible, we need to seek to repair the damage that has already been done. It is important that organisations be accountable for the use of rhetoric and marketing campaigns to promote hollow environmental claims. These must be challenged when an organisation claims to be green – they can only be so with actions, not words.

## holistic planet overview

To exemplify the urgency of the impact of climate change, if a scientist was to discover a comet was to collide with the Earth in 2025, it would become our second biggest problem. According to many, our greatest imminent concern is likely already with us.

Global climate change has been an evolving issue and has been discussed from the early 1970s. With greater economic/industrial globalisation in the 1980s, it became an international public issue. The issue of greenhouse gases (GHGs) was targeted in the 1990s for legislative attention by national governments, though not significantly enough to predict a future pattern of how the world would collectively respond to the issue. In this new century, the number of environmental events has increased significantly, and the number of storms and weather-related natural disasters has become significantly more dramatic in size and impact in recent years. Australia has seen droughts, floods, bushfires and king tides along the entire east coast. The hottest temperatures ever recorded during November across southern Australia were experienced in 2009 while during the same period England witnessed the highest recorded single day rain fall. The use of the term 'once in one hundred years' to describe an event is ironically now common place.

The culmination of these major environmental events and effects can be collectively referred to under the term 'the greenhouse effect'. There is widespread agreement from scientists and governments that human industrial activity is directly responsible for the production of gas pollution such as carbon dioxide, which is the most abundant compound responsible for producing the greenhouse effect. As industries worldwide burn fossil fuels to create energy, the by-product is carbon dioxide. The industrial revolution or the 'human project' has now been in progress for almost 300 years, starting in 1712 when the first coal-fired steam engine was utilised in the mines in England. Engines using coal, diesel oil, petrol or aviation gas as primary fuel sources have since continued to increase in number and size. The pollution that is so prevalent in cities and industrial areas is merely the tip of the iceberg when it comes to air pollution.

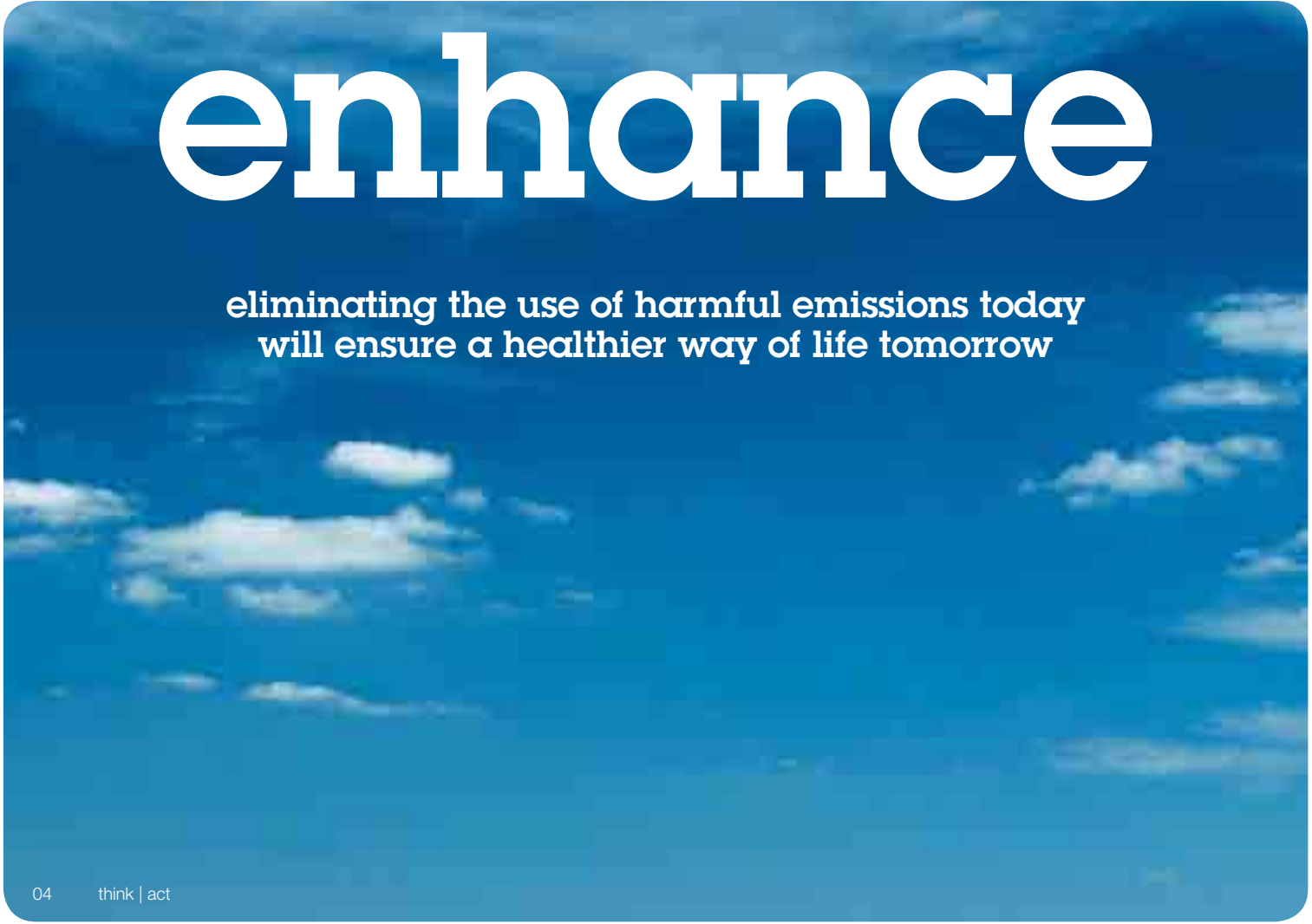
Pollution at ground level takes approximately 30 years to rise to the layers of the atmosphere where the greenhouse effect is evident. The volume of gases that find their way to the top levels of the atmosphere effectively create an insulating cover around the Earth. Each year more gases accumulate and so the gas layer becomes thicker and behaves like a 'warming blanket' around the world so that over time heat accumulates on the surface of the Earth. This process is called the greenhouse effect because this is exactly how a gardener's greenhouse works. Even in very cold climates people grow plants such as exotic flowers in tropical conditions through the use of greenhouses. Solar radiation is captured and is reflected within the greenhouse, therefore raising the temperature to a level that is seen in tropical climates. If the temperature inside the gardener's greenhouse becomes too high, the gardener merely opens some windows to release heat, which is obviously not an option to alleviate the Earth's greenhouse effect.

The greenhouse effect is not a new phenomenon. As far back as 1896 in Sweden the scientist Svante Arrhenius first proposed that with so much coal being burnt in large cities in England to supply the industrial revolution, it would not be too long before the Earth would be enveloped in carbon dioxide. At the time, London was burning 6 million tonnes of coal per year which produced about 23 million tonnes of carbon dioxide directly into the Earth's atmosphere. Arrhenius calculated that the maximum amount of carbon dioxide in the Earth's atmosphere that could be sustained over a long period of time without causing major climate change would be around about 350 parts per million carbon dioxide. He proposed that with the rate of coal burning around the world and increasing industrialisation, within about 170 years the level of carbon dioxide in the Earth's atmosphere would be so high as to cause catastrophic and irreversible climate change. Arrhenius won the Nobel Prize for his work in 1904. The most alarming reality about his calculations is that we are now more than 100 years into his predictions.

Exactly 100 years after Svante Arrhenius' work, Prof Michael Mann produced a thesis on climate change that would rouse governments around the world. He produced a graph now known as 'the hockey stick chart', where he collected tree ring and ice core samples from around the world and from these samples calculated the average temperature of the Earth each year over the last 1,000 years. Mann found that the Earth's temperature up until the early 1800s had been progressively reducing, though slightly. This direction in the Earth's temperature over the past 1,000 years was most likely due to some significant climatic event millions of years ago. Throughout this period there were times of peaks and troughs in temperature as the Earth experienced miniature ice ages as well as periods where volcanoes had erupted or the sun experienced periods of intense activity. Towards the later part of the 19th century the Earth's temperature began to rapidly climb to levels that had never been experienced before. The Earth has yet to experience temperatures anywhere near the level at the end of the hockey stick graph, but temperatures are continuing to rise alarmingly.



# reduce



# enhance

eliminating the use of harmful emissions today  
will ensure a healthier way of life tomorrow

## impact of industry

The greenhouse gases that are causing the unwanted rise in the Earth's temperature are from a wide range of sources, but the vast majority is certainly directly from human industrial activities such as transport, energy production and other industrial activities.

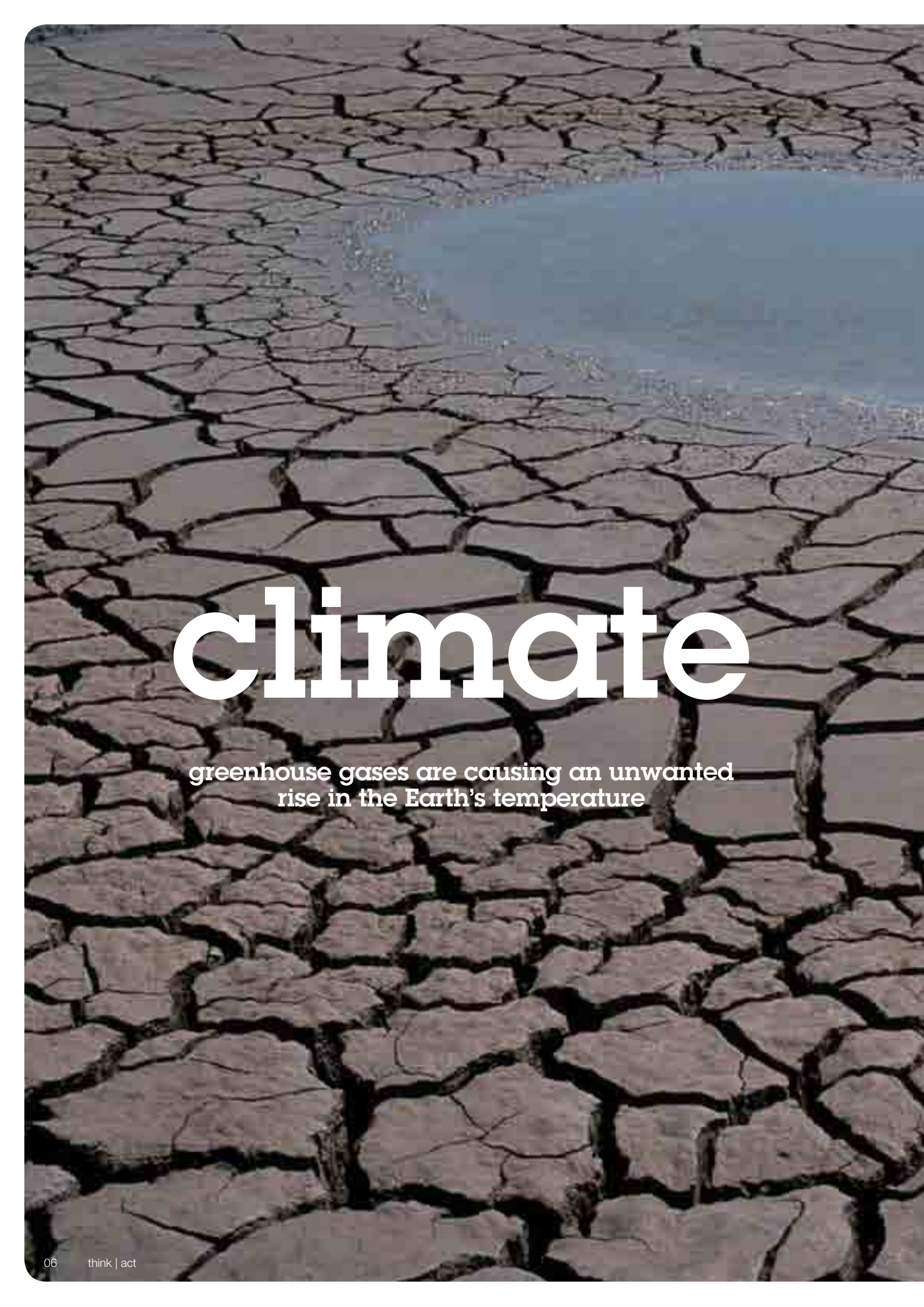
Another significant contributor is from agricultural activities such as the fertilisers used on food crops and farm animal herds. From time to time natural events such as volcanic episodes and periods of activity of our sun will also contribute to an increase in the Earth's temperature.

At the same time the technologies that support the world's population are becoming more advanced, which means food production, consumption and industrial activities increase. The progress that has occurred in China over the past decade in particular has clearly demonstrated the power of industrialisation processes in the developing world. China was a relatively minor contributor of greenhouse gases to the environment in 1990; in 2010 it will be the world's largest and growing emitter of greenhouse gas pollution. The major challenge faced by governments around the world is how societies are going to reduce their greenhouse gas emissions over a period of time when populations are increasing and people are consuming more. Some countries are extremely advanced and well-developed and so are large producers of greenhouse gases as a result, while people in the developing world want to improve their standard of living so seek to consume and produce more. The diabolical problem for global policy makers is the developing world has the right to strive to attain a standard of living that has already been experienced for many years in the developed world, which would lead to a significant increase in their industrial activity and consumption.

Somehow we must allow societies to develop, but guide them towards technologies that will be more efficient and less damaging to the environment. This is the underlying message in a body of social theory called Ecological Modernisation Theory (EMT). This body of theory was first developed in Germany in the early 1980s by Joseph Huber, who proposed that the relationship between the economy and the environment can be decoupled. According to the theory, economies can continue to grow

but not at the expense of the natural environment. Huber proposed that the most likely way to achieve this outcome is for large multinational companies to compete against each other, which would then lead to organisations seeking to differentiate themselves in the global marketplace by being more efficient. This would mean less wastage and better utilisation of resources and energy. In being more efficient the firm is able to compete more successfully against any less efficient competitor. Many academics have rejected the EMT hypothesis that industry investing in technology will result in reducing the pollution problems the world faces, thus leading to a reduction in the root cause of climate change. However, the pro-EMT theorists were given a boost when the 2007 Stern Report 'The Economics of Climate Change' and the Australian Federal Government's 2008 'Garnaut Review' into climate change proposed the best way the world is going to successfully address climate change is through the development and use of new technologies.

EMT developed further over the 25 years after its initial development in the early 1980s when some academics proposed that another way to decouple the economy from the environment was for governments to impose stringent environmental laws. In some cases governments are developing emissions trading schemes (ETs) as a way of coercing industrial and commercial organisations towards reducing their pollution.

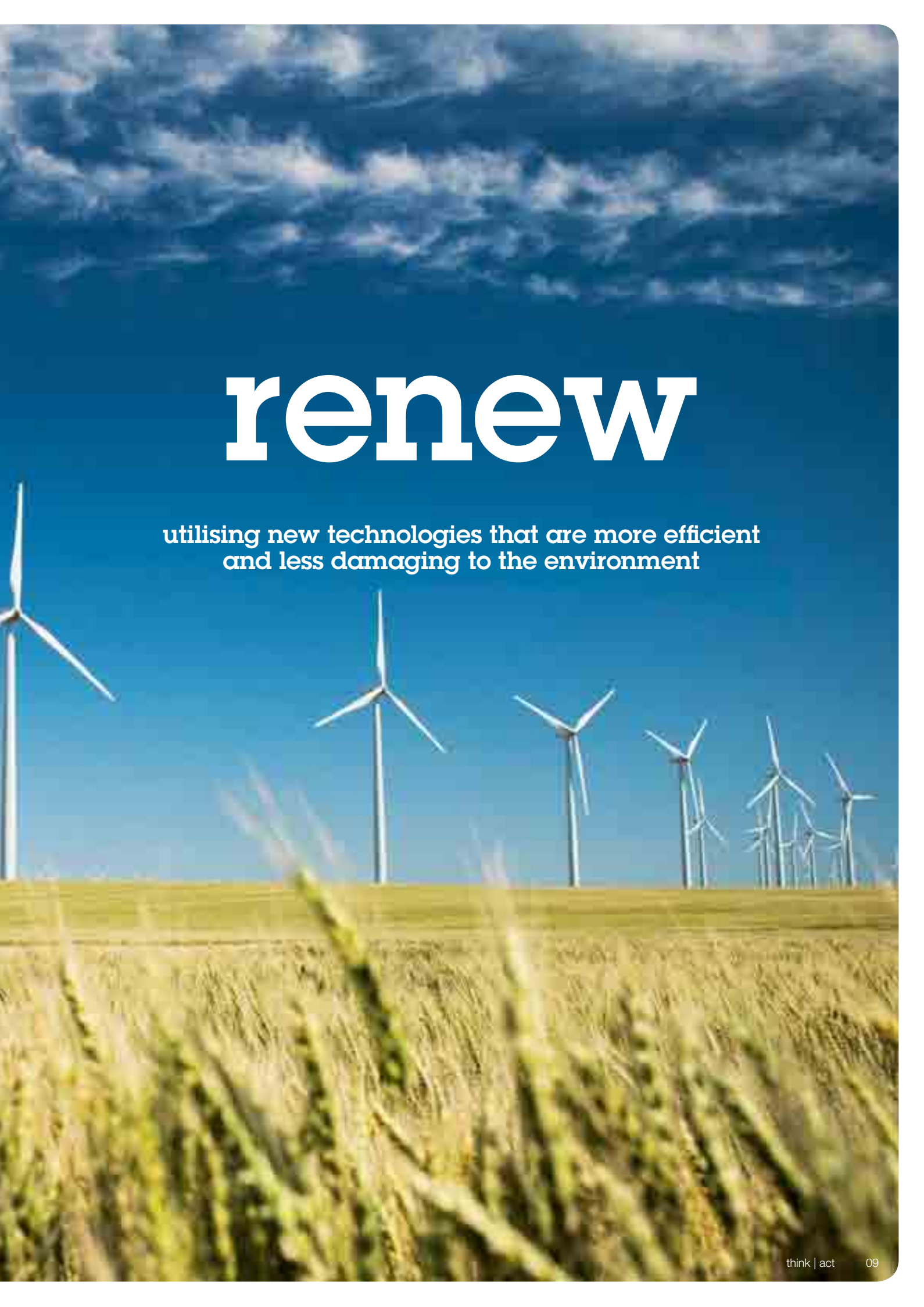


# climate

greenhouse gases are causing an unwanted  
rise in the Earth's temperature





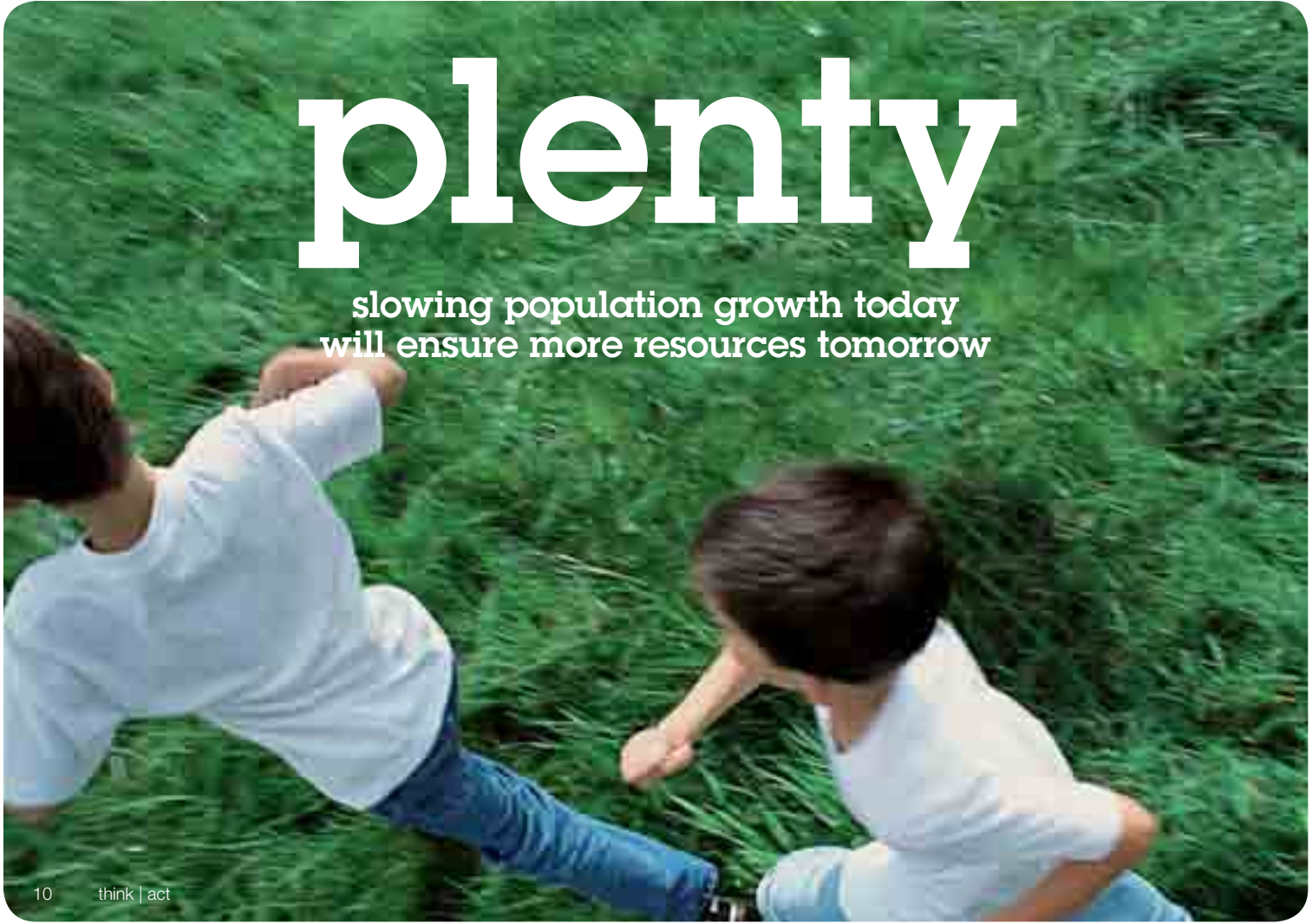


# renew

utilising new technologies that are more efficient  
and less damaging to the environment



# curb



# plenty

slowing population growth today  
will ensure more resources tomorrow

## population growth

In the late 1980s, the issue of global population growth was a major topic that was discussed widely in the popular press, with governments and also in the academic sphere. Dr David Suzuki is an environmental academic who has keenly focussed on this area and makes the key point that in the future there will be too many people living on Earth: where will they live and will there be enough food and water?

For a number of reasons, the population issue shifted off the agenda, mostly because the developed world such as Northern America and Europe are seeing declines in population growth rates and in some areas a reduction in actual population numbers. In recent times, population is again being discussed as a major driver for global climate change as national governments struggle with their international emissions reduction targets that may be set for them sometime in the future. The developing world is beginning to catch up to the lifestyle and therefore rate of consumption of the developed world, and this is being achieved under the spectre of significant increases in the population of the developing world. The Earth's population was approximately 2.5 billion people in 1955 and in 2009 this has increased to almost 7 billion people. While the vast majority of people live in the developing world, their increasing consumption is significantly impacting on the natural environment.

China has a population of more than 1.3 billion people and is now the largest consumer of coal for electricity production in the world. China is also set to overtake the US as the world's biggest producer of carbon dioxide greenhouse gas. The majority of the population of China is currently significantly below the living standards of Europe and the US, so the consumption of coal and the production of energy can only increase dramatically over the next few years.

The population debate is complex. While it is simple to deal in numbers the true impact of population growth is more closely related to how materials are consumed. This is known as the 'consumption factor'. Many scholars believe the average person living in the US or Australia would consume as many natural resources as 16 people living in the developed world. A similar ratio would also exist in the case of Europe, and so when the consumption factor is considered where Europe currently has an actual population of 730 million people, Europe has an equivalent Third World population of almost 12 billion people. In the case of the US, their equivalent Third World population would be just under 6 billion people.

The consumption perspective makes a mockery of absolute numbers when considering population.

There is no simple resolution for population as a key driver to climate change. What we do know is that the developed world, North America and Europe for example, are seeing declining populations. The concern with a declining population is the imbalance it will cause to the economic model of the developed world. This means less people would purchase fewer products: it is not in the best interest of an economic model that is based on continuous growth. With the developed world's ageing population, at some point there would be many older people needing housing, health services and welfare which is funded by fewer working age people. While less people are better for the environment, more is better for the economy. This vexed issue has been acted on in recent times in Australia when former Treasurer Peter Costello asked Australians to have more babies; a sentiment also echoed in the UK to the British public in 2009.

The relationship between population, poverty and environmental damage has been discussed in academic literature. A number of researchers propose that if the developing world, in countries such as China, India and Indonesia, were able to achieve education standards comparable to North America and Europe, we would then begin to witness a decline in population. The challenge is that in 2050 the world will have a projected population of 10 billion people. If current consumption rates are the expected norm, through applying a consumption-based ratio, the equivalent Third World population would be approximately 80–100 billion, an almost inconceivable figure. Approximately 10,000 years ago the world had a population of around 100,000 people living a subsistence lifestyle and 100 years ago the population reached 1 billion people. The future solutions for the impact of population on the natural environment include the simultaneous reduction in absolute numbers and reduction in the individual footprint of each person.

autogas

regular  
unleaded

replace

reinvent

modifying current technology today  
will result in emission reductions tomorrow



## the role of industry in emission reduction

Many industries have strived to become more efficient over time as a result of competitive pressures and to combat the increasing cost of inputs such as raw materials, labour and energy. Some industries claim to have identified that their consumers want to buy products that are environmentally responsible. The most obvious industry in this regard is the automotive industry where cars are changing from petroleum-based fuel to alternative fuels such as gas, hydrogen and electricity in order to move towards zero emissions.

The current ubiquitous internal combustion engine used in cars, trucks and buses around the world is not energy efficient. Even in the most efficient models, significantly less than 50 per cent of the energy created actually propels the vehicle forward and in most cases it is actually closer to 30 per cent. Most cars in use today lose about 70 per cent of the energy created through the use of fossil fuel because of heat. The significant benefit of other fuel types lies not in the type of fuel but in the efficiency of the fuel used. For example, although electric cars still use energy produced in a remote power station, as much as 85 per cent of the energy produced is used to move the vehicle forward. This is a massive increase in efficiency over the use of petrol.

The result is that the automotive industry not only has to change the way cars are manufactured, but also the way cars are run and the way fuel is produced and distributed. This process is called 'creative destruction' and is a major change for the automotive industry. The term creative destruction was first coined in the mid 20th century by Joseph Schumpeter, one of the most highly regarded economists of that period. He suggested that the only way any industry could make a quantum leap in change was to completely destroy itself and then go through a process of reconstruction or reinvention. Creative destruction is a fundamental tenet of Ecological Modernisation Theory (EMT). The automotive industry is going through a process of ecological modernisation through completely destroying the current fuel and fuel distribution systems in order to have completely new cars that are driven and supplied energy in more efficient ways. Creative destruction is a major upheaval in any industry, hopefully for the better. In many cases the processes of creative destruction mean a complete restructuring of the workforce as well as the technologies themselves. Both workers and consumers are required to learn new skills as they manufacture and offer new products in the marketplace. As a result, creative destruction can also be the source of a wide range of opportunities. The highly regarded German social theorist Ulrich Beck has described this as an 'industrial metamorphosis'.

Not all industries have benefited positively from the processes of creative destruction and modernisation. For example, the design and production of television sets has changed considerably over the past 20 years. The carbon dioxide emissions from a single television set that was manufactured in 1990 operating for an average amount of time would cause approximately 45–50kg of carbon dioxide emissions each year as a result of its electricity consumption. In the case of today's new technology, an average new television used for the same amount of viewing time each week could output as much as 450–500kg of carbon dioxide. That is a 1,000 per cent increase in pollution output directly from the development of a new technology. Television manufacturers have developed new technologies in order to develop new markets where people want bigger, brighter, thinner and flatter television screens, not ones that are less polluting. The problem is that achieving these new technologies for an increasing market share has resulted in a massive increase in greenhouse gas emissions through use and production. In this case, the television manufacturing industry has experienced what could be considered as the opposite to ecological modernisation; however it has been through a process of creative destruction because television sets are made today using a completely different technology to that of 20 years ago.

The major forces that act on industry today are competition between firms and the need to develop new markets, as well as the increasing pressure to become environmentally responsible. Governments are challenged to ensure that technologies are developed with environmental impact in mind, but at the same time have to be aware that consumers desire certain products and technologies. On the one hand people want to drive energy efficient and environmentally friendly cars, but on the other they also want to have the latest and most pleasurable technologies, as seen in the case of consumer demand for the latest television technology. The inconsistency of society poses significant policy problems for governments and corporations in regulating environmental responsibility.

## how the printing industry has adapted to climate change

The printing industry is one of the world's oldest industries. It commenced in its current form in Germany in 1455 with Johannes Guttenberg, however the Chinese were also printing in one form or another 300 years prior; movable type was invented by Bi Sheng of the Chinese Song dynasty in the 11th century between 1041 and 1048.

The importance of printing to the Chinese people was clearly obvious to the world during the opening ceremony of the Beijing 2008 Olympic Games. The printing industry's history in China can be traced back almost 1,000 years.

The massive growth of printing throughout Europe was the result of the transformation of the paper industry around the known 'old world' from the mid 1800s. In 1719, a Frenchman named Rene Antoine Ferchault de Reaumur witnessed how wasps build their nests from a pulp made from wood fibre; his observation was the key to a remarkable change in papermaking. Previously, cotton waste was the main ingredient in papermaking and the demand for printing was growing so much that the collection rates of cotton waste could not keep up with the demand. When paper started to be made from wood fibre in the early 18th century, the forests in Europe were large enough to make as much paper as the industry needed, and as a result the volume of printing expanded significantly. The growth in the industry increased again in the early 20th century with a combination of new metals, new chemicals and the use of electricity as a new source of energy. Throughout the 20th century, printing was the major form of mass communication even after it was challenged with other communication technologies such as radio and television, and later with the internet.

Like other industries experiencing the forces of ecological modernisation and creative destruction, the printing industry was also notably challenged toward the end of the 20th century. Michael Porter, arguably Harvard University's most highly regarded business strategy scholar described the global printing industry as one of the most intensely competitive industries from a list of 104 global industries. The intense competition between printing firms means that the best way to maintain business is to become more efficient, which is also the experience

of a number of other industries. The intense competition between printing firms makes the need for efficiency even greater. As a result, in the last quarter of the 20th century printing firms world wide continuously pushed for the development of new technologies to the point where printing as an industry and a process had changed significantly, particularly over the last decade of the century.

Prepress technologies, which include design, platemaking and proofing, have changed so much that graphic arts film has all but been eliminated from the trade. Computer to plate (CTP) technologies have meant that with technology alone printing reduced its environmental footprint by about 95 per cent or more since the Kyoto base year of 1990. The uptake of CTP was extremely rapid around the world due to intense competition, which would then drive the need to become more efficient in order to achieve or maintain a competitive advantage. The introduction of CTP would mean the learning of new operational skills and significantly less workers being required, and old prepress processes were completely destroyed as new ones were created. This was a clear example of the processes of creative destruction and ecological modernisation in the printing industry occurring in the last 10 years of the 20th century. Some academics have also referred to the process as one of 'de-materialisation' or using fewer materials from nature.

Other areas of printing have also been through a period of change. Printing machines have become faster and much easier to use, and the skills required by the press operator have shifted from mechanical to computer-based. The changes in the last 10 years of the 20th century to the printing machines would make the processes of printing far more efficient and the changes and developments have continued. Various inputs used in the printing process have also changed significantly, for example the inks and other chemicals used in the printing process have become

significantly more 'human friendly' and environmentally responsible, but more importantly the volume required of these inputs is much less than 20 years ago.

The changes that have occurred in the printing sector over the past 20 years have been considerable. The printing industry has simultaneously been through the two processes of ecological modernisation and creative destruction, possibly more so than any other industry group. Importantly, both of these processes have resulted in a significant improvement in the eco footprint of the industry sector. The changes have been overwhelmingly brought about by the intense competition that exists in the industry, as described by Michael Porter. Printing has not been directly impacted by rigorous government legislation or even from intense customer pressure forcing it to become less environmentally damaging. Almost all changes have come from within the industry itself through technology advances and the positive impact on the environment is measurable. While other industries have sought to become environmentally responsible and have developed technologies specifically for their customers, the printing industry sector has achieved environmental responsibility by following the main proposition put forward by Nicholas Stern and Prof Ross Garnaut in their reviews about climate change. That is, technology can have a significant role to play in the mitigation of global climate change.



# stop



# grow

planting sustainable forests today  
will ensure old growth forests survive tomorrow

## perceptions of the printing industry

The relationship between a printed item and a tree in a forest is a strong association made by all levels of society.

There has been an attempt over the past 20 years to develop a process where people who purchase printing services are able to feel comfortable that the paper utilised is actually from forests that have been planted specifically for papermaking and not from natural old growth forest areas. Trees harvested for papermaking are the same as any other economic agricultural crop such as wheat, corn or rice. The main role played by certifications such as the Forestry Stewardship Council (FSC) and the Program for Endorsement of Forestry Certification (PEFC previously the Pan European Forestry Council) is to offer some assurance to printing industry consumers that the original wood used to make their paper is from legitimate and sustainable forest sources.

# discredit

if companies that pollute are simply allowed to pay others  
not to pollute then there is no advantage to the environment

## offsetting emissions

The term 'offsetting' is a familiar term when dealing with carbon dioxide emissions, it seems like a convenient solution to an inconvenient problem. However, there is little evidence to support the value of offsetting as a solution to the world's significant environmental problems.

The concept of offsetting was born out of an emissions trading scheme (ETS) proposed and first enacted in the EU in the mid 1990s. The offsetting programs that existed were framed in legislation and operated between the major manufacturing, energy-consuming and energy-generating companies in Europe. Offsets were used as a mechanism within the legal framework to reduce the financial burden on companies with excessive greenhouse gas emissions.

Market opportunism has created a vibrant voluntary market selling carbon dioxide offsets to firms and organisations which are not covered under any legal framework. Companies are instead using offsets which have no solid basis of measurement to balance against the firm's carbon emissions, which have not been measured in any standardised way. The outcome of the current voluntary carbon emissions market is a significant opportunity for rhetoric rather than action.

The term 'offsetting' has some interesting historical roots. If a wealthy landowner or nobleman committed a crime in 15th century England, they could choose to offset the punishment to someone else, who for a payment would take the punishment on their behalf. In many cases the person who would provide the offset would be a recently widowed woman who lived in the village or town. The most common form of offset punishment was for this woman to be strapped to a contraption that consisted of a rope and chair where the woman would be repeatedly dunked into a cold river. The number of times she was dunked corresponded to the punishment that was allocated to the original convicted person. This process seems little different today, where firms that pollute are simply allowed to pay others not to pollute and somehow it is seen as being environmentally beneficial. If one firm is simply compensating for the pollution of another firm, there appears on face value to be no benefit to the environment.

## reduction not offsets

The single most effective way to reduce greenhouse gas emissions is to reduce the volume and extent of the use of fossil fuels in generating energy.

In its various forms, energy is the engine of the industrial revolution. Fossil fuel is a resource held underground in a number of forms; in Australia the most abundant is coal; in the Middle East it is in the form of liquid oil; in the Boreal Forests in the northern hemisphere it is in the form of peat; and in some parts of the Americas it comes in the form of shale. Regardless of the form that fossil fuel takes, it has all been created in roughly the same way. Millions of years ago the surface of the Earth was covered with extensive forestry which had developed over millions of years. As the forest fell and regrew and then fell again, there was a thick layer of dead vegetation that covered the Earth that over time was covered by soil. Across millions of years and incredibly intense pressure and heat, the dead vegetation was decomposed into one of the various forms of fossil fuel: almost pure carbon in the case of coal or hydrocarbon in the case of oil.

Before the industrial revolution, small amounts of coal were burnt mostly for heating and some for metal refinery. However, with the invention of the steam engine by Thomas Newcomen in 1712, a major machinery source for the industrial revolution was created. During this time there was also a significant increase in the use of coal as a source of energy.

## trees as carbon offsets

Trees in old growth forests and in plantations absorb and store carbon dioxide, the major greenhouse gas. Because trees absorb carbon dioxide, there is a conflict between two extremes: advocates for the plantation of trees as a crop and usable resource, and advocates for trees not to be cut down.

The protagonists arguing for the use of trees as resources argue that trees can be used for industrial purposes such as pulp and paper in the printing spectrum, but also for construction, furniture and anything made of wood. Those lobbying for trees not to be cut down would argue that trees should only be used for a combination of absorbing carbon dioxide and sites for biodiversity.

Many organisations have gone through or will go through the process of measuring their individual carbon output and so will arrive at a volume of carbon dioxide their business activity produces over the course of a year. Under the offset system, they can then choose to purchase a number of trees which they believe will then absorb that same amount of carbon dioxide. This activity is called 'offsetting the organisation's carbon emissions'. The science behind the measurement of the amount forestry absorbs carbon dioxide is still in dispute. Points of contention include whether soil be included, and the impact of natural loss and bio-diversity. These are all additional considerations that are currently testing the limits of measurement. Some research proposes that old growth forests should be referred to only as a 'carbon sink'; that is it no longer absorbs carbon dioxide, but is now simply a body of timber that is holding on to carbon dioxide that has been historically absorbed over the life of the forests. The only real value in offsetting is if the forests are guaranteed by the owner not to be burnt down or destroyed in the future, which could result in that stored carbon being released back into the atmosphere. Some people refer to this as offsetting by threat, 'you pay and we won't release the carbon dioxide'. This raises the question for the companies and individuals who pay for offsetting in the case of carbon sinks or old growth forests of whether those forests would be either legally cut or accidentally burnt down in the future.

Another form of forestry offsetting is planting new trees, which is known as reforestation or afforestation. This is where a body of land exists that is clear of trees for some historical reason, perhaps for some other agricultural activity which is no longer viable,

and so reforestation is the restoration of the land back to its original forest state. An example of this was during the long period of European control of much of South East Asia, local farmers were obligated to clear forests to grow rubber trees, pepper and tobacco or other cash crops for the Europeans. The cash crops stripped the land of nutrients over a period of time which meant that long after the demand for these products from South East Asia wanes, the land may no longer support forest growth. Finally, reforestation could be unsuccessful if some land is empty because it never supported forestry at all in the past for reasons such as lack of water, lack of nutrients or a high wind channel. The condition of young trees at the time they have been planted is important in considering their long term viability. To justify a payment against the commitment to sequester carbon, there needs to be some kind of natural or legal guarantee that the trees should survive to maturity. Trees can take some time to reach the size where the volume of carbon they absorb is significant enough to be measured. If a tree takes 50 years to reach maturity, it would seem that the tree would need to be at least 15 years old before it is absorbing enough carbon dioxide to justify any offsets. This raises significant questions with new growth forestry offsets of which anyone buying offsets must be very mindful: should the first 15 years of the tree's life be disregarded and should the assumption be made that the trees are actually going to survive these early delicate years? The problem for Australia is that some areas will experience extended droughts and all forests in Australia are prone to bushfires. Forestry offsets based on new growth must come with some consideration of the likelihood that the trees may not survive to maturity.

The difficulty associated with trees growing in Australia has not gone unnoticed by academics. Australian soil contains almost no nutrients after two hundred years of poor farming techniques, and regular weather extremities such as flood and drought. It is likely that a long term guarantee for strong tree growth is unrealistic in many places in Australia.

# future

no single green energy is likely to be enough to be  
a complete solution to the world's energy needs



## other methods of carbon offsetting

Tree growth and old growth forestry are not the only methods of addressing carbon dioxide accumulation in the Earth's atmosphere. Trees are a quick and simple solution for many to a complicated problem.

There are many alternatives to offsetting and indeed other offset opportunities exist which are far more reliable than simple tree growth. According to Stern, the author of 'The Economics of Climate Change (2007)', the utilisation of newly developed technologies is set to be the most significant way that industrial society can address the accumulation of carbon dioxide in the Earth's atmosphere. In Australia, in Prof Garnaut's submission to the Australian Federal Government in 2008, Garnaut noted that highly efficient technologies are the key way that industry will reduce its carbon emissions.

A further method of addressing the accumulation of carbon dioxide in the Earth's atmosphere is the use of green power in any one of its various forms. No single green energy such as wind, solar, hydro or tidal power is likely to be enough to offer a complete solution to the world's energy needs. Possibly a combination of these and other new, yet to be developed technologies, will deliver a measurable reduction in carbon dioxide emissions. Despite its relatively small population, Australia is a world leader in alternative energy methodologies, and also a world leader in research into developing carbon-free energy systems for the future. One technology which is particularly exciting is 'hot rocks' in central Australia, where geothermal energy is harnessed from resources found a few kilometres below the Earth's surface. The potential of this energy source alone is massive as it may offer an energy resource close to zero emissions. As an alternate to investing in trees, it may be considerably more advantageous for organisations to invest in environmental research; the future will be created by today's ideas.

There are methods of absorbing carbon dioxide and holding it for long periods of time which may be more reliable than tree growth. There is vastly more carbon held in the world's soil than is held in the world's vegetation. There has been recent discussion about how Australia in particular, which has very poor agricultural soil, finds ways to absorb

and hold carbon in the ground, and how in the long term, it benefits crop yield and water efficiency. It has been found that newly developed soil-based carbon sequestration technologies can deliver vastly greater benefits in the long term than planting trees alone. One simple benefit worth discussing is while the only way to accurately measure the amount of carbon absorbed by forests is to cut the forest down, in the case of soil, samples can be taken to the laboratory at regular intervals and the level of carbon can be measured over time with minimal impact to the natural environment. Soil-based carbon sequestration is an absolute and measurable method of reabsorbing the carbon dioxide from the Earth's atmosphere. Investing in soil-based carbon offsetting is potentially far more reliable than simply planting a tree. Australia has a number of scientists who are leading worldwide research in this technology, which is once again an ideal opportunity for organisations investing in research.

**“For some firms, offsetting is an admission that a reduction in carbon emissions cannot be attained. Setting a carbon target is an acknowledgement by firms and their management that regardless of their business activity, carbon dioxide is going to be emitted into the atmosphere...”**

## the problem of carbon neutrality

Any organisation that places itself in a position of seeking to be carbon neutral will likely face a number of challenges.

The first issue is that any firm operating their business must assume their activities will consume resources, consume energy and no matter how negligible, there will likely be some level of waste. The only way the firm is able to call themselves carbon neutral is to engage in some form of offset program, and in order to make the absolute statement that they are carbon neutral they would have had to accurately measure a transparent method of carbon output and then employ an offset compensation that is equal to their carbon output. This situation does not currently exist unless the individual firm is making a conscious effort to purchase more offsets than required. For this reason, government authorities, not only in Australia but also internationally, are actively seeking out and challenging organisations and firms that describe their business activities as being carbon neutral.

For many firms, it is more appropriate to set a target which can be used to reduce the firm's carbon emissions. For other firms, offsetting is an admission that a reduction in carbon emissions cannot be attained. Setting a carbon target is an acknowledgement by firms and their management that regardless of their business activity, carbon dioxide is going to be emitted into the atmosphere; as soon as the light is turned on, a car is started, a telephone call is placed or a web page is being read on a computer, there will be carbon emissions. It is effectively impossible in our current era to produce no carbon dioxide. The most appropriate activity for any firm is to acknowledge that carbon dioxide is produced and it needs to be measured, and then engage in activities to reduce that carbon dioxide emission to a more desirable level. If industry is able to significantly reduce its carbon emissions, then other carbon sequestration technologies can more effectively absorb and hold on to the carbon dioxide that is being released into the atmosphere.

## forestry accreditations

The history of certifications such as the Forestry Stewardship Council (FSC) and the Program for Endorsement of Forestry Certification (PEFC) began in 1988 with a United Nations conference that focussed on the problem of global deforestation, particularly in the tropical regions along the equator.



The main concern of the United Nations at this time was that tropical forests were rapidly being cut down, or worse, burnt down so that the land could be used for some other purpose such as grazing cattle or growing alternative crops like bio-fuel and animal feed. Much of the land cleared in South America was done so to grow feed for battery breed chickens in Europe. According to Stern land use change, away from forestry is the description of the worst case environmental damage. Sometime after the 1988 conference had concluded, a small group of global Non Government Organisations (NGOs) believed that not enough progress was being made to save the world's tropical forests. In order to establish a mechanism to protect these forests, the FSC was formed by a body of NGOs, mainly lead by the World Wide Fund (WWF) in North America, with the aim to protect tropical forests. The FSC would quickly develop a forestry certification system and produce a logo that could be used to publicly show that legitimate timber had been used in the production of a wide range of wood products including pulp and paper. The FSC is an organisation dominated by environmental and social pressure groups. In order to protect forests from exploitation, NGOs have placed themselves on the world stage using well-developed forestry environmental standards.

A few of years after the FSC was established, the forestry pulp and paper industry in Europe saw that the FSC was gaining recognition for certified and sustainable forestry. European industry needed to respond in order to publicly confirm their commitment to the environment and the protection of forests against exploitation such as illegal logging and wanton land clearing. The PEFC was established in 1996 and consisted mostly of industry parties, some government bodies and local European NGOs. The standards that the PEFC worked with were similar to those developed by the FSC. While the FSC has developed its own forestry standard and logo, the European-based PEFC looked to existing forestry

standards around the world and allowed those standards to call themselves PEFC if they satisfied the PEFC criteria. The PEFC is an industry group that registers national standards rather than certifying forests themselves. In order to better reflect their activities, the PEFC changed their name to the Program for Endorsement of Forestry Certification in 1998. While retaining the same acronym, the new name reflected the true meaning of the aims of the program.

What has ensued over the past 15 years has effectively been a battle on the world stage for the rights to certify the world's forests. The FSC in particular has been highly critical of the PEFC and has often attacked them publicly as being an inferior forestry certification agency. The PEFC has significantly larger areas of forestry under its label and is also recognised by governments and large organisations around the world, having now expanded beyond their European origins.

One of the interesting issues that both the FSC and the PEFC face today is that although they both started with the aim to protect the tropical forests of the world, as of late 2008 only a miniscule percentage of tropical forests fell under either of their certifications. The vast majority of forests that have FSC and/or PEFC certifications were actually situated in those areas of the world that were not considered significantly at risk, at least compared to the tropical forests along the equatorial zone. During the second half of 2008, both global certification groups recognised the need to somehow engage with the tropical forestry lobby. Prior to this, the FSC in particular had been particularly aggressive in its condemnation of forestry activities along the equator. The PEFC, however, were silent in any criticism and appeared to be working behind the scenes with the forestry certification groups along the equatorial zone to see how these national standards can be brought into agreement with the PEFC. Both certifications are now actively pursuing the opportunity to certify forests in the tropical equatorial zone.

The forests in the northern regions of the world that have historically been used to make paper are forests that are populated with extremely slow growing trees. A seedling tree in those areas could take as long as 80 years to grow to full maturity, which means that the forester who planted the tree may not even be alive by the time the tree is ready to be harvested. The amount of land that is tied up in the slow growth process is massive, and the forestry planners need to plan approximately a full century into the future in order to assess what the consumption of trees will be. On the other hand, tropical forests are completely different. A seedling tree planted in the equatorial zone would take only five to seven years to reach full maturity. This means that every hectare of land in the tropics is equivalent to 80 hectares of forestry land in the colder northern regions. The relationship between the speed of tree growth and the area of land required has significant direct environmental impact, but also reveals some significant carbon sink and sequestration opportunities. For this reason the equatorial forests are now being addressed with the recognised environmental standards that have been around for more than 15 years.

When forestry used for pulp and paper making is certified with either of the two global certification groups or one of the other 50 or more recognised national certifications in the world, these forests would generally be referred to as 'sustainable forestry'. Sustainable forestry is an agricultural industry where the crop is trees and those trees are grown specifically for purposes such as construction timber, furniture or pulp and paper. In the case of sustainable forestry, the trees that are grown are harvested and then regrown, as with any crop, which then provides income for the forestry owner. This raises the social issue that in the equatorial zone where there is a potential for extremely rapid forest regrowth, there are vast numbers of people who live in poverty. The opportunity to engage in a successful forestry industry is a significant opportunity to alleviate poverty. If only for

this reason, it is a very positive social move that the two most recognised forestry certifications, the FSC and the PEFC, are now engaged in tropical forestry.



# waste



# save

implementing energy saving processes today  
will ensure better sustainability for tomorrow

## Environmental Management Schemes and other certifications

An Environmental Management Scheme (EMS) is used to help organisations understand how their business activities are impacting on the natural environment. The common theme with EMSs of all types is that they fail to work effectively unless the senior management of the company are committed and are seen as the driving influence behind the implementation of the scheme.

An EMS is almost guaranteed to fail if the top management of the organisation does not acknowledge the value to their business and their stakeholders in becoming environmentally sustainable. While all employees can be critical to the implementation of environmental activities within the company, it is essentially reliant on senior management to ensure they set the direction of the firm.

Any company, large or small can start an EMS. The individual firms take their own actions to explore their own business processes with the aim to engage employees to make processes more efficient so that resource and energy wastage are minimised. There is a formal process for an organisation to engage in an EMS, which is to adopt the international standard ISO 14001. This is an environmental management standard which in itself is not a measure of a firm's reduction in their environmental footprint, but is a process of documenting how the business is operated so that any areas of duplication or waste can be eliminated from the firm. There has been some criticism of ISO 14001, stating that it is not an environmental standard, however ISO 14001 is implemented by the firm in order that its operations and processes become more efficient, and it is the efficiency increases that then deliver the environmental benefit. Inefficiency in any organisation can be translated to an increase in effort in order to produce its goods and services, and this excess effort means there is a waste of energy, natural resources and people.

The first step in entering the ISO 14001 process is for the firm to set in place their environmental strategy; this requires the full commitment of the senior management. It is a significant step on the path towards environmental sustainability for the individual firm.

One of the most common methods utilised in the printing industry to make an environmental statement is to print on recycled paper.

The term 'recycling' is merely a phase that bears no official regulated meaning and in itself is not an environmental certification or standard. It is in fact just the name of the industrial process: if something is recycled, it was used once and is used again.

In the 1970s, the world was facing the environmental threat and impact of acid rain. Acid rain was a direct result of dirty diesel and industrial fuels being used mostly in Europe and parts of North America. Poorly refined fuels have a high sulphur content that finds its way into the atmosphere through the exhaust emissions from engines. Combined with sunlight and the moisture from clouds, the sulphur dioxide in the exhaust systems turned into sulphuric acid, and it fell back to the ground as acid rain. Acid rain rapidly killed large forest areas throughout North America and Europe; vast tracts of land were denuded of trees as the foliage was destroyed.

The developed world responded by installing a tax on the amount of sulphur dioxide that companies were producing and so the incidence of acid rain progressively declined over time. The policy mechanism in this case was a simple economic driver: in order to reduce the impact of the tax the organisation needed to reduce its emissions of sulphur. As all firms that emitted sulphur were taxed equally, there was an equitable cost to all competitors. This was the first time the world's governments worked together on an intangible threat caused by industrial development and it may be considered a good potential model for a future carbon trading scheme.

Acid rain was killing forests in Europe, which would have resulted in the paper companies simply running out of wood and potentially halting the production of paper. Some years would pass before forests would recover to a level where wood fibre could again be harvested in the volume that is required for the global printing industry. The solution was to source the fibre from what paper companies would come to refer to

as the 'urban forest'. In other words, the industry sought to take back the fibre they had already produced. The beginnings of the recycling process bore no relationship to an environmentally-based argument or strategy as recycling was simply used as a method of ensuring that the paper industry had continuity in the supply of wood and wood fibre. Community groups and NGOs soon believed they saw a benefit to using and reusing paper, and so paper recycling began to be discussed in terms of an environmentally sound process. It could be that using recycled paper is in fact more damaging than using sustainably grown forestry. Academic and scientific research on the environmental footprint of plantation and sustainably harvested forestry is limited, with detailed research on the use of recycled paper fibre relatively unexplored in the scientific and academic communities. It merely sounds like 'the right thing to do'.

The complete recycling process is extensive and it is quite easy to forget the steps and processes that need to take place to convert the collected waste paper back into clean white paper. The first part of the process is where paper needs to be collected from businesses or individual households in the community. A collection process required an additional new set of infrastructure implemented specifically for collecting used paper. While many Australian local councils now have recycling bins, there is a process where trucks need to drive around the city picking up bins full of paper, often unsorted and contaminated with other materials such as general rubbish and food waste. Once the paper has been collected, it then needs to be taken to a sorting area and separated into various categories of clean paper waste like white paper, newsprint and cardboard packaging. The type of paper needs to be determined so that particular types can be sold to the appropriate de-inking and pulping businesses. If the recycling and pulping firms are located overseas, as is often the case, the transportation of large volumes of waste paper needs to be considered in the eco-footprint of

the total process. The next major impost on the environment from the recycling process is the de-inking stage, which is the removal of the printed image from the paper. Currently there are only two ways to remove printing ink from a sheet of paper: one is a potent combination of chemicals and the other is energy, and usually a combination of both is used. The impact of these processes also needs to be added to the total impact of the overall recycling process on the environment. Once the de-inking stage has been completed, the sludge that is recovered as a by-product of the old ink and the chemicals used in the process need to be disposed of either by burning or landfill. Once the steps are completed, the rest of the papermaking process is generally the same as with the new pulp, however the recycling process does not have the benefit of bio-fuel, which is associated with the waste materials extracted from the raw wood. In the case of most papermaking mills around the world, bio-fuel now accounts for almost 75 per cent of the total energy use in the papermaking process.

At best, there would be no discernible difference between the environmental footprint of using recycled fibre to make paper compared with using virgin wood fibre from sustainably grown forests. There have been few scientific research projects that have investigated the use of recycled fibre compared to the use of virgin pulp, and one of these studies has determined that it is actually dangerous to the environment to use recycled paper fibre. Print buyers and society generally need to understand that recycling is a description of a process and is not itself an environmental specification or standard.

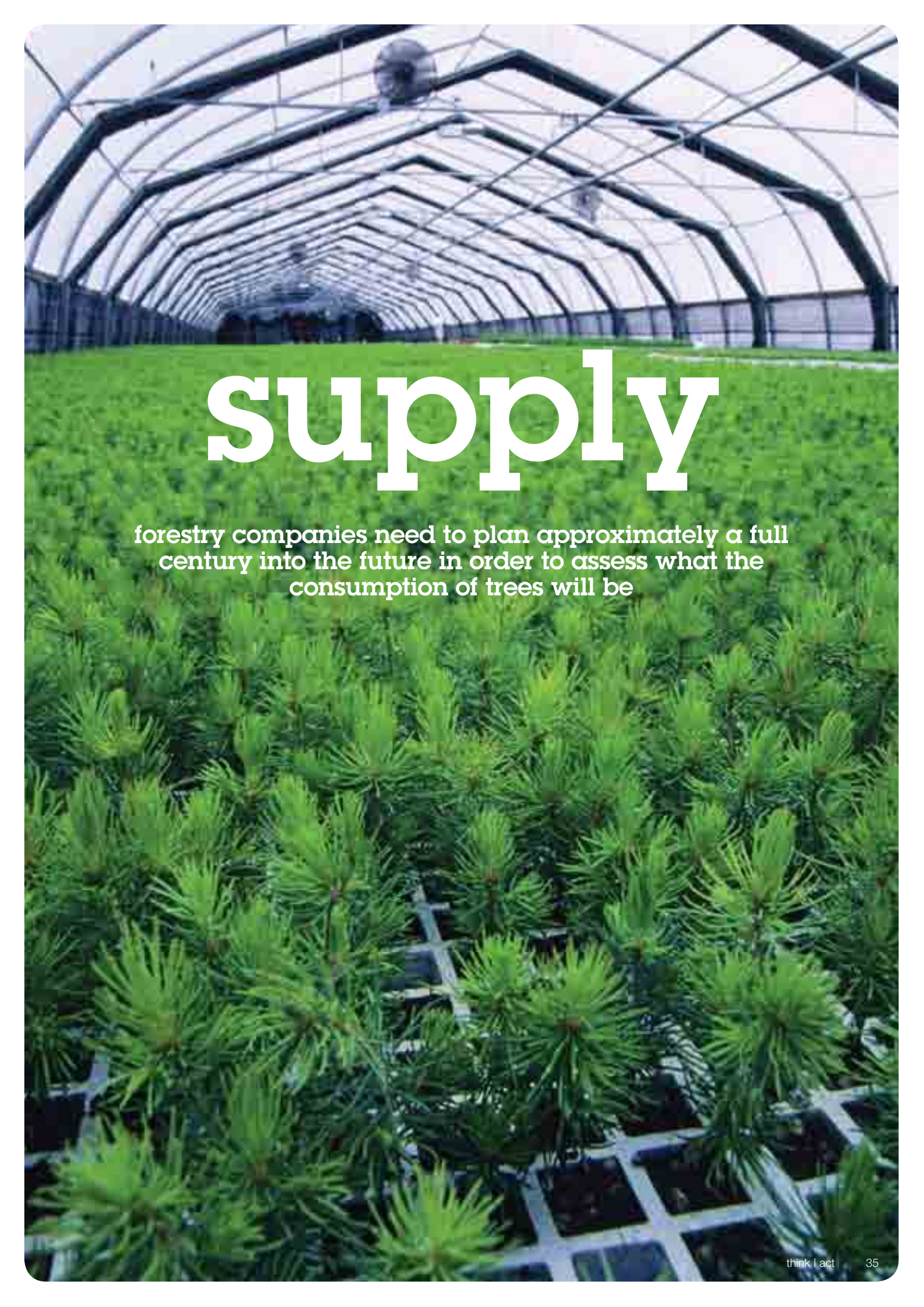


A large pile of cardboard boxes and paper waste, with the word "options" overlaid in white text.

# options

it could be that using recycled paper is in fact more  
damaging than using sustainably grown forestry

**“The forests in the northern regions of the world that have historically been used to make paper are forests that are populated with extremely slow growing trees. A seedling tree in those areas could take as long as 80 years to grow to full maturity, which means that the forester who planted the tree may not even be alive by the time the tree is ready to be harvested.”**

A large, arched greenhouse structure filled with rows of young pine trees. The trees are planted in black plastic trays, and the greenhouse has a high, vaulted ceiling with a central ventilation fan. The perspective is from inside the greenhouse, looking down the rows of plants.

# supply

forestry companies need to plan approximately a full century into the future in order to assess what the consumption of trees will be

## life cycle analysis

Society's view of recycled paper as being 'environmentally friendly' highlights a significant weakness in organisations' attempts to become environmentally sustainable.

Society needs to understand that in making a genuine attempt to become sustainable, what sounds right may not be what is actually right. The only way to determine the robustness of any process is to consider every individual step in the process, which is termed 'considering the full life cycle analysis'. There are many definitions of life cycle analysis that can be used when conducting an environmental audit of any industrial process. When considering overall environmental performance, the impact of every step in the production process should be considered: purchasing, delivery and finally use and then disposal. There have been limited complete life cycle analyses carried out on commonly used products in society today. As the world shifts towards legislative carbon emissions schemes, the need to completely measure every aspect of the industry will become increasingly more important and legitimate. A detailed analysis of the environmental impact of such schemes will raise some surprising results when industries that are understood to be environmentally friendly actually turn out to be significantly damaging. At the same time, there will be industries that have been accused of significant environmental damage that will actually be seen as relatively environmentally friendly. Printing is likely to be a prime example of this. While many people may negatively associate the printing industry with cutting down trees and endangering the environment, the reality is that it as a process yields only a minimal impact on the natural environment.

Any industrial activity consumes energy and natural resources. This is not only the case with manufactured goods, but also with service industries such as those related to the internet. To keep the internet functioning in the US alone, it requires more than 11 per cent of the entire country's electricity production and this figure does not take into account the energy required through the accessing of the internet by the millions of people around the world who log on to US-based internet web pages. To access web pages on the internet obviously requires a computer, either

a laptop or desktop system, and for each minute that a person somewhere in the world is reading the document on a computer screen, there has to be electricity produced at an electrical power plant to drive that computer or to charge the computer's batteries. The amount of electricity required to display a PDF or a web page on a screen for one minute is roughly equal to printing 100 pages of full colour, double sided prints on a high speed production printing machine.

The efficiency of modern printing machinery has improved immensely over the past 20 years, or since the Kyoto Protocol base year 1990. The electricity required in the eco-footprint of each individual printed page is negligible. The printed page is also a long term sequester or carrier of carbon held within the paper. When the paper is buried in landfill or retained on file, the carbon is locked up for the entire life of the product. Almost all modern papers have an archival property, which means that the majority of papers will not degrade significantly over time and will last intact and readable for hundreds of years. The EU considers permanent carbon sequestration to be 70 and the expected life of paper is far beyond that.

There has been only scant consideration in regard to environmental damage in the comparison between alternative types of media. For example, television advertising has a massive eco-footprint throughout its entire life cycle. At the planning, preproduction and production stages of a television advertisement, a moderate estimate would be that more than 60–100 tonnes of carbon dioxide is emitted for a 30 second television commercial. A sophisticated high quality international advertisement will more realistically be hundreds of tonnes of carbon dioxide. Just as printing is a media that goes out to thousands or in some cases to millions of people, television also has a massive audience, in some cases to billions of people around the world. When one television advertisement is played on a plasma television for 30 seconds, enough electricity is used to produce a 16

page full colour catalogue including delivery to a house. A printed catalogue or brochure has a longer life of days or weeks and then can be shared among multiple people: the television advertisement will be replayed multiple times each day, which once again builds on the electricity output required. In recent years, the Australian, New Zealand and UK governments have considered to assessing the environmental damage caused by large screen plasma televisions, and part of this consideration is possible import restrictions on this technology. Plasma television screens produce 1,000 per cent more carbon emissions than that of previous television technologies. Clearly, while printing has massively reduced its eco-footprint since the Kyoto Protocol base year of 1990, television production has done exactly the opposite.

**“The time for simplistic and motherhood statements on environmental problems is well past. The only way the world is going to address climate change is through genuine, well researched and carefully implemented environmental strategies.”**

## the good news

Academics and others who work in the area of environmental policy development have identified that the key way that industries can address the negative impact on the environment is for industries to become more efficient and embrace more efficient intelligent technology.

Where companies take a more thoughtful and intelligent approach to environmental challenges, they tend not to respond to environmental problems with simplistic knee-jerk reactions or potentially deceptive marketing activities. In the major environmental reports that have been produced over the past few years, there has been an emphasis on organisations needing to develop well-considered strategies for addressing climate change issues. Large companies in the near future may be required to measure their environmental footprint and engage in either compulsory or voluntary reporting of their environmental damage. Where this occurs, it will be important that companies fully understand the significance of their actions and reactions. The time for simplistic and motherhood statements on environmental problems is well past. The only way the world is going to address climate change is through genuine, well researched and carefully implemented environmental strategies.



# demand

in the developing world consumption is significantly  
impacting on the natural environment



## the changes at Southern Colour

Southern Colour, a Melbourne and Sydney based commercial printing company, is a prime example of ecological modernisation and de-materialization in action within the printing industry sector.

Southern Colour enacted their first major changes in 2004, when the FSC chain of custody certification was achieved, a certification considered mandatory in the print industry today for any firm purporting to be concerned about the environment. Southern Colour was the first Australian printer to achieve this certification. Southern Colour also gained PEFC certification as FSC certification alone is not broad enough to cover all the stock ranges they required. Both the FSC and PEFC allow Southern Colour to be part of a broader philosophy and environmental consciousness through regulated purchasing channels.

While the FSC and PEFC certifications are a significant achievement, they actually require little change to be undertaken as far as internal environmental policies and behaviour within the firm. Southern Colour have acted beyond the requirements in obtaining FSC certification and have ventured to undertake other significant environmental changes to their organisation.

In 2009, Southern Colour committed to significantly review the printing equipment and technology in the business and subsequently installed latest generation Heidelberg printing machines. Through this technology upgrade, it became possible to significantly decrease the energy requirements of the printing process and therefore the direct environmental footprint of the business. The new printing presses are approximately 40 per cent more efficient than previous models, which means that the same amount of electricity is now used to produce 40 per cent more print. This is a significant energy saving and results in a marked reduction in the resultant production of greenhouse gases. This investment in printing equipment has echoed precisely the recommendations to industry from Stern, Garnaut and other environmental groups to invest in new technologies as a clear, effective and immediate way to reduce greenhouse gas emissions by industry.

Southern Colour has secured ISO accreditations that represent internationally recognised benchmarks for best practice. The management of the company installed ISO 4801 Health and Safety, ISO 9001 Quality Management and ISO 14001 Environmental Management Systems (EMS). ISO 14001 regulates important environmental areas such as waste disposal, emissions, recycling, and noise pollution. Combining the ISO accreditations, especially ISO 14001, with FSC and PEFC certifications, Southern Colour was able to satisfy its internal and external environmental obligations above and beyond the print industry standards.

The FSC, PEFC and ISO 14001 are not specifically targeted to or designed for the print industry. These specifications are a set of parameters that can essentially govern the business practices of nearly any company in any industry. Southern Colour has considered them strong platforms to work from, despite each lacking the exhaustive specifics that are unique to the printing industry. As a result, Southern Colour developed its own set of environmental practices to supplement the guidelines offered by the FSC, PEFC and ISO 14001, called 'Ecolour'. Part internal philosophy and part protocol, it is a mechanism used to identify and monitor in greater depth areas such as energy consumption, emission reduction, technology efficiencies, chemical minimisation, internal air quality and water recycling found in the printing industry in more specific detail and in greater depth.

The international accreditations and the practices set out in Ecolour combined with new press technology efficiencies deliver sound and responsible environmental policies. Southern Colour have proactively sought to enact real and measurable change in their organisation today rather than deferring responsibility for emission production to the next generation through intangible future offset schemes.

**“In 2009, Southern Colour committed to significantly review the printing equipment and technology in the business and subsequently installed latest generation Heidelberg printing machines. Through this technology upgrade, it became possible to significantly decrease the energy requirements of the printing process and therefore the direct environmental footprint of the business.”**

## suggested reading

International and national environmental debates are complex and difficult to fully appreciate without a detailed review of the historical background and in-depth knowledge of current research.

There is a wealth of material available to the person who is devoted to achieving a full understanding of environmental issues. Rather than provide the reader with a list of material to read, a number of scholars and authors might be more helpful. Following is a brief overview of each of these key people which will give the reader some further information.

German sociologist Prof Ulrich Beck holds a professorship at both the Munich University and at the London School of Economics and his work covers modernisation, individualisation and globalisation. Beck has been key in the roots of modern thought on the impact of industrial activity on society. He initially proposed a theory of 'reflexive modernisation' where organisations and society would continuously advance by learning from their past activities. He then developed the concept of 'risk society theory' where he suggested that as large industrial organisations impose on the world there are many invisible risks. More recently, Beck has been exploring the role of 'sub-politics' which is the understanding of how new large global organisations influence local, national and international policies: this is encapsulated his study of 'cosmopolitanism'.

Prof Joseph Huber has been the chair of economic and environmental sociology at the Martin Luther University of Halle-Wittenberg since 1992. Huber was the first academic to put forward the idea of Ecological Modernisation Theory (EMT) in 1982. This body of theory suggested that as large global organisations expanded their operations, it is highly likely that they would 'naturally' become less damaging to the environment because the organisations would strive for increased efficiency as a method of reducing costs. It is likely that the form of EMT that was proposed by Huber was as a response to Beck's 'risk society theory'.

Prof John Dryzek is Professor of Political Science and Australian Research Council Federation Fellow, Research School of Social Sciences, at the Australian National University. According to the Australian National University's website, "he is best known for his contributions in the areas of democratic theory and practice and environmental politics ... [and is] one of the instigators of the 'deliberative turn' in democratic theory". The politics of the environment is a complex area of study and Dryzek is one the world leaders in this issue.

Dr Peter Christoff is the coordinator of Environmental Studies at the University of Melbourne and the Vice President of the Australian Conservation Foundation (ACF). Christoff challenges the effectiveness of a technology form of EMT as a solution to the Earth's environmental problems and suggests the strongest response to the problem is an active civil society.

Other key scholars in ecological modernisation, environmental politics and global environmental issues are: Arthur Mol, Gert Spaargaren, David Sonnenfeld, Martin Janicke, Michael Rock, Robert Welford, Albert Weale, Maarten Hajer and Tim Flannery.



Phillip Lawrence, Author

Master of Business in Management, by Research, Ecological Modernization Theory –  
University of Technology Sydney / UTS

Graduate Diploma, Business Administration – University of Technology Sydney / UTS

PhD Candidate, Environmental Studies, Ecological Modernization of the Indonesian  
Economy and Society – Macquarie University, Sydney



**Spicers Paper**

This book is printed on Spicers Paper 9Lives 80 Gloss, a paper composed of 80 per cent post-consumer fibre and 20 per cent totally chlorine free pulp. 9Lives 80 is a Forest Stewardship Council (FSC) mixed source certified paper, identifying that all virgin pulp used in manufacture is derived from well managed forest and manufactured by ISO 14001 mills.



Melbourne  
2 Southpark Close  
Keysborough VIC 3173  
Australia

T 61 3 8796 7000  
F 61 3 9701 5539

Sydney  
Unit 6, 12 Frederick Street  
St Leonards NSW 2065  
Australia

T 61 2 9460 7199  
F 61 2 9460 7899

[info@southerncolour.com.au](mailto:info@southerncolour.com.au)  
[www.southerncolour.com.au](http://www.southerncolour.com.au)



**Mixed Sources**  
Product group from well-managed  
forests, controlled sources  
and recycled wood or fibre  
Cert no. 365-COC-006603  
[www.fsc.org](http://www.fsc.org)  
© 1996 Forest Stewardship Council