

Paper facts

General comments

- Australia's per capita consumption of paper = 200 kg's p.a., equating to 72 kg's CO₂ emissions Versus operating a plasma television 5 hours per day x 6 days per week = 450 kg's CO₂ emissions. (source Phil. Lawrence)
- Patrick Moore, the founder of Greenpeace declared – "the easiest way to reduce carbon dioxide in the atmosphere is to increase forests and increase the harvesting of them." (VicForest seminar)
- The Rio Earth Summit in 1992 adopted global principles to promote sustainable forestry, stating that Sustainable Forestry meant harvesting and environmental management went hand in hand.
- Massachusetts Institute of Technology study into learning found that print based learning was 50 times more efficient than screen based learning.
- Worldwide deforestation (includes illegal logging, land clearing, and forest fires) accounted for the single largest source of land use change emissions in 2000, being responsible for over 8 billion tonnes of CO₂ emitted. (Stern Review)
- 95% of emissions from land use change originated from tropical developing countries – 55% tropical Asia, 30% tropical America, 10% tropical Africa. (Stern Review)
- "Explosion" in emissions in developing regions reflects land use changes tied to development - clearing forest for agricultural production and habitation. (Stern Review)
- Tropical deforestation has a strong effect on emissions as tropical forests typically hold on average 50% more carbon per hectare than trees outside the tropics. (Stern Review)
- Worldwide plants and soils store over 7,300 billion tonnes of CO₂ equivalents, more than double that held in the atmosphere (2,700 billion tonnes CO₂). (Stern Review)
- Agriculture accounted for 14% of "green house gas emissions" in 2000 – of which use of fertilisers 38%, livestock (methane) 31%. (Stern Review)
- Fossil fuel burning and cement production emitted 20 billion tonnes of CO_{2e} during the 1980's (Stern Review)
- 50% of CO₂ emissions caused by human activity are from coal and gas burning power plants. (Stern Review)
- Globally, industrial forestry including the planting of new forests (afforestation) and re-establishing old forest areas (reafforestation) is estimated to result in the absorption annually of 1 billion tonnes of CO₂. (Stern Review) Neither the Stern Review nor Kyoto Protocol mentioned concerns relating to industrial forestry.
- Only 8% of the world's forests (equivalent to 277 million hectares) are certified FSC / PEFC or similar, and of

this, only about 5% of this is used for paper production – 20% of global needs. (total area closed canopy forest = 3,454 million hectares) (Source – International Council of Forest and Paper Associations)

- Canada has 20% more forested land today than 20 years ago, and Finland 17%
- Australia's Eucalypt, comprising 700 species is one of the world's most widely planted plantation forest trees, in 90 countries covering 18 million hectares, and a significant fibre source for the pulp and paper industry, and a study by the Eucalyptus Genome Network (Eucagen) is aiming to maximise its potential for bioenergy and for capturing excess atmospheric carbon. (Eucagen – www.eucagen.org)
- It is estimated that there are 25% more trees in the developed world today than in 1901. (source Phil. Lawrence)

General Australian Industry "Facts"

- Australia's consumption of paper / paper board is approximately 4.2 million tonnes. (Communication papers – 2.2 million tonnes, Packaging and Industrial – 1.7 million tonnes, Health and Hygiene – 0.3 million tonnes)
- Employment in the "extended" paper industry, including all supply chains from forestry to recycling = 350,000, 3.3% of Australia's total employment. (source – accumulation of industry information)
- Australia has a trade deficit of approx. A\$1.96 billion in wood and wood products (including paper) p.a. (source NAFI)
- Australia's imports of printed matter, excluding packaging, is approximately 200,000 tonnes p.a. (source ABS stats.)
- In Australia fibre from plantation timber makes up 26% of paper industry fibre needs, regrowth natural forest 8%, sawmill residues 7%, imported pulp 11%, and recovered paper (recycled) 48% (source A3P) - total fibre needs approx. 3.2 million tonnes.
- E-waste in Australia, according to the ABS data, is growing at more than 3 times the rate of general municipal waste (mainly household), with 1.6 million computers dumped to landfill in 2006 – considered internationally as a major problem. (Source ABS stats)

Forestry "Facts"

- Carbon is cycled continuously through the Earth's natural systems – Carbon released (emitted) through "breathing" taking in oxygen and releasing carbon dioxide, and decay of organic matter. Carbon sequestered (absorbed) by plants as they grow, with some transferred to soil.
- The Kyoto Protocol does not recognise the continuing stored value of embedded carbon in timber and paper products.
- Forestry and wood products (including paper) make a significant positive contribution to Australia's carbon balance. The net "sink" in forests and wood products is approximately 10% of Australia's annual net Green

House Gas Emissions of 565 million tonnes of CO₂ equivalents.

- The Eucalypt is capable of sequestering carbon at a rate of 10 tonnes of carbon per hectare per year, and has a positive net carbon balance even when used for pulp and paper production. (source: Eucagen)
- About 45% of Tasmania is "locked up" in National Parks, and 86% of "old growth" forests, and 97% of "wet wilderness" forest has permanent protection. (Source – Mike Grey Weekly Times July 11, '07)
- Less than 0.2% of Victoria's public forest is available for harvesting each year, and allows for an approx. 80 year cycle. (source: VicForests)
- Forests and timber are "sustainable" resources, capable of harvesting and regrowth. Which resource is sustainable and can be re-grown from these commodities.... Iron Ore, Oil, Coal, gas, bauxite, wood? (refer bar graph in "Forests, Wood and Australia's Carbon Balance)
- Forests in Australia store an estimated 10.5 billion tonnes of carbon (excluding soil carbon) – equivalent to 38.5 billion tonnes of CO₂ removed from the atmosphere. About 70 times Australia's net annual greenhouse gas emissions. One tonne of carbon = 3.67 tonnes of CO₂ (carbon dioxide).(source Forest and Wood Products Research and Development Corporation)
- 99.2% of carbon is held in native hardwood forests, both commercial and conservation. Balance held in plantations.
- Australian plantations and commercial forests removed a net 43.7 million tonnes of CO₂ from the atmosphere in 2004. (source: FWPRDC)
- Accumulated storage of carbon in Australia's forest plantations and wood products (including paper) is approximately 323 million tonnes, of which 230 million tonnes is in wood products. (source: FWPRDC)
- "By removing carbon dioxide from the atmosphere, forests, forestry, and the use of wood products (including paper) are helping mitigate climate change". Comment by FWPRDC
- Carbon is only released back into the atmosphere when wood or wood products decay or are burnt. (source FWPRDC)
- All forests in Australia cover about 21% of the land mass – 164.42 million hectares. (source: NAFI)
- 7% of Australia's forests are managed by State forestry agencies as potential wood sources. (source: NAFI)
- 13.2% of Australia's forests are set aside for conservations zones / environmental protection. (source: NAFI)
- 23.9% of forests are on private land. (source: NAFI)
- Economic value of the forest and wood products industries is about A\$18.6 billion – 3% of Gross National Product.
- Choosing wood in house construction over other energy intensive construction alternatives where possible, would save the equivalent CO₂ emissions of up to 25 tonnes of carbon dioxide per house. (refer graph).
- More than 95% of carbon in wood / wood products (including paper) remains stored even after up to 30 years in landfill.(source: FWRDC)
- In Australia in 2004 a net 14.9 million tonnes of carbon (54.68 million tonnes of CO₂ e) were removed from the atmosphere through sustainable forestry and the increase in carbon stored in wood products. (source: FWRDC)

- Using wood to generate energy in place of fossil fuels provides further carbon benefits. Firewood and residues from processing wood and wood products contribute about 2.5% of Australia's energy use. (source: FWRDC)
- Net carbon dioxide emissions from generation of electricity using biomass (wood residues etc) are typically only 5-10% of those from fossil fuel (oil and gas) based electricity generation. (source: FWRDC)
- Future carbon trading arrangements will likely include carbon sequestration in sustainable forestry arrangements as an offset to Green House Gas Emissions.

Forestry and Paper Accreditation Schemes commonly used within Australia

The vast majority of paper manufacturers supplying the Australian market are operating under accredited systems which assist to minimise their impact on the environment and recognise their commitment to SUSTAINABILITY, covering fibre sourcing, manufacturing processes, and in products delivered to the market.

- The forestry and paper industry is at the leading edge of "Environmental Certification".
- International Environment Standards include the globally recognised ISO 14001, being the standard for Environmental Management Systems commonly adopted by the pulp and paper production sector, as well as ink and print chemical producers to achieve effective environmental management through the production process.
- EMAS (Eco Management and Audit System- European Council regulation) similar to ISO 14001 in its intent, and commonly used on papers sourced from Europe to promote environmental credentials.
- PEFC (Program for the Endorsement of Forest Certification) International accreditation system for recognising sustainable forestry management practices with Chain of Custody extensions covering all wood processes from the forest to the consumer. Widely adopted by the broad industry internationally.
- FSC (Forest Stewardship Council) An international accreditation system pioneered by the World Wildlife Fund and Greenpeace, similar in intent and operation to PEFC, promoting responsible stewardship of the world's forests, covering sustainable use and management. Variations of requirements occur from country to country. Also includes Chain of Custody (COC) similar to PEFC requirements and with broad industry adoption.
- Currently approximately 8% of the world's forests are covered by accreditation schemes (PEFC, FSC, or similar) and increasing. Of this only 5% is used within the pulp and paper industry, accounting for 20% of the industry's fibre needs.
- 43% of Australian forests are certified under the AFCS (Australian Forest Certification Scheme – AFS Australian Forestry Standard which is PEFC endorsed) and FSC.
- The paper industry is also moving in the direction of carbon neutral paper.

Sources: web sites of organisations mentioned, AFS Ltd., NAFI, A3P, FSC, PEFC

Pulp and Paper Production

- Over time the list of the United Nations 100 most “sustainable” industries has included 8 pulp and paper companies – the highest of any industry group. (source: Phil. Lawrence, Stora Enso)
- Up to 30% less wood fibre is used today per tonne of paper produced than 10 years ago owing to greater use of fillers, coatings, etc. (Source: Phil. Lawrence, Stora Enso)
- There are 18 pulp and paper mill sites operating in Australia. (Industry Edge)
- Local paper and paper board production = 3.2 million tonnes, includes approx. 450,000 tonnes Newsprint, 650,000 tonnes Printing and Communication papers, 220,000 tonnes Tissue, and 1.88 million tonnes of Packaging and Industrial papers. versus consumption of 4.2 million tonnes. (Industry Edge)
- 48.4% of paper produced in Australia is made from recycled fibre. (source: FWRDC)
- In Australia 31% of energy used by the pulp and paper sector comes from renewable sources (Biomass and hydro). (source: FWRDC)
- Australian paper manufacturers have capital assets worth approximately A\$4.6 billion. (A3P)
- Typical of trends worldwide, Australian paper producers reduced energy consumption per tonne of production by 24% between 1990 – 2003, with further savings made in recent years. (source: A3P)
- CO₂ emissions per tonne of production by Australian paper manufacturers reduced by an estimated 21% during 1990 – 2003. (source: A3P)
- Water used per tonne of production has reduced by approximately 63% since 1990, with water being used on average up to 5 times. (source: A3P)
- Worldwide “water factories” have been constructed to convert waste water to “consumable” water suitable for industry, with a new facility being constructed by Gippsland Water due for completion in 2008 allowing Australian Papers Maryvale mill to draw water from this facility, reducing its draw on freshwater by 13% (source: PaperlinX Limited)
- The worldwide adoption of either TCF (TOTAL CHLORINE FREE) or ECF (ELEMENTAL CHLORINE FREE) bleaching processes has significantly reduced the use of toxic chemicals and reduced harmful emissions (dioxins).
- Similarly the use of Oxygen Bleaching has reduced chemical use.
- Australian pulp and paper plants are licensed to operate by individual state Environmental Protection Authorities (EPA)
- Trend for pulp and paper manufacturing is to become carbon neutral.

Paper Distribution

- Throughout Australia there are over 14 distribution businesses involved in the distribution of paper.
- Forestry to market accreditation through Chain of Custody requirements gained by many distributors through endorsement by FSC and / or PEFC.

- Australian paper distributors account for approx. A\$1.5 billion in sales per annum.
- Responsible for the distribution of more than 3,000 branded products

Pre-Press, Printing, Inks and Circulation

- Print has been a continuous industry since invented in 1455
- Print based learning said to be 50 times more efficient than screen based. (Massachusetts Institute of Technology study)
- Use of CTP and auto blanket washing has reduced solvent and water use by approx. 90% compared to 1990 (source: Kodak / Phil. Lawrence)
- Make- ready times have reduced from an average of 2 hours to 15 minutes since 1990, reducing paper waste by 80%
- Australia has approximately 5,000 printing establishments
- Printing employs approximately 115,000 staff directly, equivalent to 10.7% of all manufacturing jobs in Australia. (source: ABS)
- Current printing machine technology is reportedly up to 60% more energy efficient than 20 years ago. (source: Heidelberg Aust. / GAMAA)
- Australia Post recorded growth in mailed articles of 1.8% in 2006, to approximately 5 billion articles, the strongest growth in several years (source: Australia Post)
- Australia imports approximately 200,000 tonnes of printed matter per annum, excluding packaging. (source: ABS)
- Printing an A4 page single sided on a laser printer uses the same energy consumption as printing the equivalent of 100 A4 pages in full colour both sides on a heat set web offset press. (source: Phil. Lawrence)
- Printing Industries Association of Australia and Lithographic Institute of Australia are combining to facilitate the implementation of an Australian version of the International Graphic Arts Standard – AS/ISO12647/2 for colour management.
- Printing industry growth +8.5% for year ended June '07. Industry sales stood at approximately A\$18.8 billion (source: PIAA)
- The European paper industry, including the graphic industry and postal sector in undertaking a massive “Print sells” campaign to promote the benefits of print to “communicate brands” effectively – “Print. Your brand in their hands”.
- 87% of householders regularly read unaddressed advertising material (e.g. catalogues) (source: Franklin Web)
- Distribution Standards Board (DSB), a self regulatory arm of the Australian Catalogue Association (ACA) aims to maintain responsible industry practice in the distribution of catalogues – reducing the volume of unsolicited material.
- Australian catalogue industry supports a workforce of approx. 180,000, with advertising spend of A\$1.94 billion.

(source: ACA)

- In 2007 it is estimated that approx. 8 billion catalogues will have been produced on behalf of retailers, distributed mainly through household letterboxes.
- Catalogue advertising rates as 3rd. largest consumer directed advertising medium (16%) behind newspapers (31%) and TV (28%)
- Catalogues account for approximately 320,000 tonnes of paper consumed in Australia.
- A healthier and safer workplace through PIAA / ASCC launching Essential Chemical Controls for Australian Printers.
- Printing Industries Association of Australia has published an Environmental Management Manual available for Australian printers, as well as Green Stamp Program accreditation being trialled by PIAA West Australian region.
- Studies undertaken show that print generates 72% more awareness of products and services by consumers than TV given a certain budget. (source: SAPPI)
- In Europe the percentages indicate people buying something after media consumption: reading a magazine 36%, watching a television commercial 27%, reading a newspaper 26%, reading an insert supplement 21%, accessing websites 20%, commercial radio 11% (source: SAPPI)
- A study of medium types in Europe showed that the medium containing information of most interest by ranking were: magazines 45%, newspapers 36%, TV 30%, internet 24%, radio 8%
- 2005 – 2006 ABS statistics show that retail sales of printed material and paper stationery = A\$5.5 billion.
- In the 12 months to end June 2007 Australian magazine gross annual readership reached 963,146 million. (source:MPA)
- Australian gross copy sales of consumer magazines was about 223 million, with a sales value of about A\$1.06 billion.(source: MPA)
- There are approximately 4,500 magazine titles on offer in Australia (source: MPA)
- 90% of magazines in Australia sold via retail outlets, and 10% through Direct Mail. (source: MPA)
- Book sales in Australia are about 50 million per annum, with a retail value of around A\$1billion. (source: Nielsen Bookscan)
- Book sales have averaged 7% per annum growth for the past 3 years in units sold. (source: Nielsen Bookscan)
- Australia imported approximately A\$1.2 billion worth of printed matter in 2006. (source: ABS)
- Development of waterless offset ink / waterless printing has reduced liquid waste from developing fluid and waste water from plate dampening whilst enabling quicker registration and colour matching, reducing “make – ready” waste.
- Trend from solvent based ink to vegetable / soy based inks.

Recycling

- Australians recycle approximately 46% of their overall generated waste, growing by 825% over the past 7 years. (source: ABS – Australia’s Environment: issues and trends)
- Australia ranks No. 1 in the world for newsprint recycling, which has grown from 28% in 1990 to 75% in 2006 (source: PNEB)
- Australian Catalogue Association (ACA) estimates recycling rates of catalogues in Australia at around 80%.
- In 2006 waste paper and board collections totalled approximately 2.5 million tonnes, of which around 1.5 million tonnes was used domestically and 1 million tonnes exported, mainly to China and India. (source: Visy, PaperRound)
- 48% of the Australian paper manufacturing sectors fibre needs come from recycled paper. (source: FWRDC / A3P)
- Australia’s overall paper and cardboard recovery and recycling rate is estimated at 64%
- The Federal Government has said that it will consider including in an emissions trading scheme, waste which can be recycled to generate offset credits, and therefore having a value, likely to increase Australia’s overall recycling rates.
- Reusable pre-press chemistry containers introduced to replace previously used 20 litre drums sent to landfill. (Toyo Inks)