

WINE INDUSTRY SECTOR AGREEMENT

Climate Change & Greenhouse Emissions Reduction

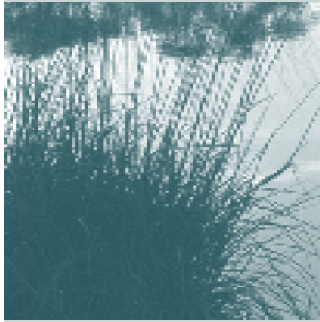


Government of South Australia Wine Grape Council SA



SOUTH AUSTRALIAN WINE INDUSTRY ASSOCIATION INCORPORATED

5 INFORMATION SHEET 5 : CLIMATE CHANGE OVERVIEW



Climate change is a global issue that affects us all. Changes in climate patterns mean that extreme weather events, such as heat waves, floods, storms, droughts, and bushfires will become more frequent, more widespread or more intense.¹

This Information Sheet is intended to provide an overview of the key elements of climate change information and summarises some of the Federal and State Government initiatives to tackle climate change, that are of interest to the wine industry.

Further information and resources are documented in *Climate Change and the Wine Industry – Overview of Programs and Information, November 2008*, which forms part of this Information Package.

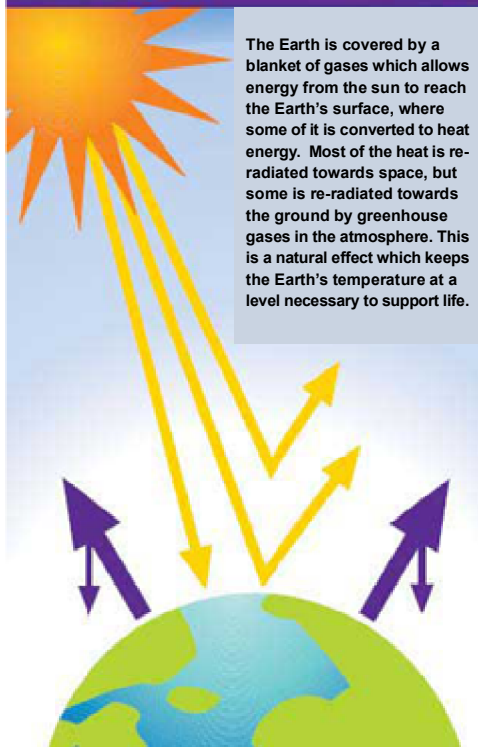
What causes climate change



Climate change is the result of changes in our weather patterns because of an increase in the Earth's average temperature. This is caused by increases in greenhouse gases in the Earth's

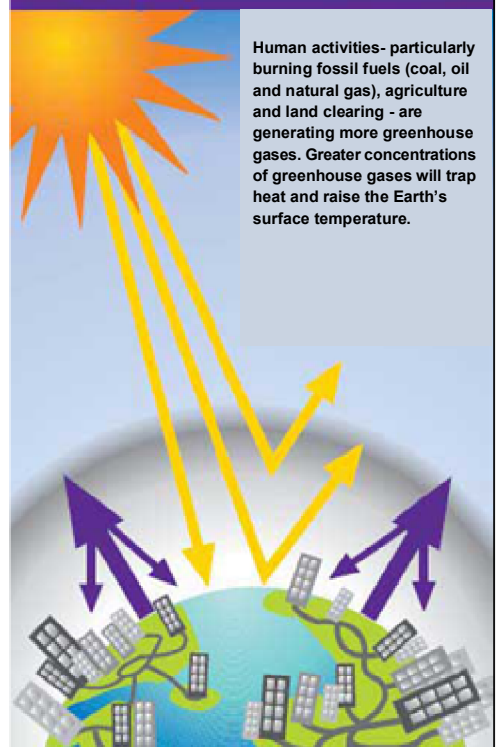
atmosphere. These gases soak up heat from the sun but instead of the heat leaving the earth's atmosphere, some of it is trapped, making the Earth warmer.²

GREENHOUSE EFFECT



The Earth is covered by a blanket of gases which allows energy from the sun to reach the Earth's surface, where some of it is converted to heat energy. Most of the heat is re-radiated towards space, but some is re-radiated towards the ground by greenhouse gases in the atmosphere. This is a natural effect which keeps the Earth's temperature at a level necessary to support life.

ENHANCED GREENHOUSE EFFECT



Human activities- particularly burning fossil fuels (coal, oil and natural gas), agriculture and land clearing - are generating more greenhouse gases. Greater concentrations of greenhouse gases will trap heat and raise the Earth's surface temperature.

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¹Department of Climate Change, Climate Change: What does it mean? Available at <http://www.climatechange.gov.au/science/publications/fs-climatechange.html> accessed 23 October 2008.

²Department of Climate Change, Climate Change: What does it mean? Available at <http://www.climatechange.gov.au/science/publications/fs-climatechange.html>

One way of thinking about climate change is water flowing into a bathtub...



Increasing global temperatures are driven by the **increase in the concentration of carbon in the atmosphere**. Before the industrial age, the concentration was about 280 parts per million (p.p.m.) of carbon in the atmosphere.

After a few centuries of burning coal, oil and other fossil fuels, the concentration has increased to 387 p.p.m., and it continues to rise by about 2 p.p.m. every year. Many scientists believe that we need to at least stabilize carbon concentrations at 450 p.p.m. to ensure that global temperatures don't increase more than about 2 degrees Celsius above the pre-industrial level.

To do that, we need to reduce global carbon emissions until they are equal to or less than the amount of carbon captured by the oceans and plant life. It's just like water in a bathtub — unless more water is draining out than flowing in from the tap, eventually the bathtub will overflow.³

Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report findings

The Intergovernmental Panel on Climate Change (IPCC) is an international body that assesses the latest science of climate change. In 2007, the IPCC released its Fourth Assessment Report, concluding that:

- warming of the climate system is unequivocal,
- humans are very likely to be causing most of the warming that has been experienced since 1950, and
- it is very likely that changes in the global climate system will continue well into the future, and that they will be larger than those seen in the recent past.

These changes have the potential to have a major impact on human and natural systems throughout the world including Australia.

Climate Change in Australia

The IPCC reports provide limited detail on Australian climate change, particularly when it comes to regional climate change projections. For this reason the former Australian Greenhouse Office, through the Australian Climate Change Science Programme, engaged CSIRO and the Bureau of Meteorology to develop climate change projections for Australia.

This resulted in a report and website called *Climate change in Australia* and is based upon international climate change research including conclusions from the IPCC's fourth assessment report. It also builds on a large body of climate research that has been undertaken for the Australian region in recent years.⁴

Australia's Future Climate

As well as observed changes in climate, *Climate Change in Australia* also projects future temperature and rainfall for Australia for 2030, 2050 and 2070 based on low, mid and high emission scenarios. The best estimate of annual warming over Australia by 2030 relative to 1990 is about 1.0°C for the mid range emissions. Warming will be a little less in coastal areas and a little more inland.⁵

Unlike temperature which is always simulated to increase, climate model results for rainfall change show decreases and increases for many locations. Decreases in rainfall are likely in southern areas of Australia in the annual average and in winter, in southern and eastern areas in spring, and along the west coast in autumn.⁶

Maps showing observed changes and climate change projections for Australia for temperature and rainfall are available on the website www.climatechangein australia.gov.au.

³ Adapted from: Walsh, B. 'What the Public Doesn't get about Climate Change' in *Time* 28 Oct 2008.

⁴ <http://www.climatechangeinaustralia.gov.au/> accessed 20 November 2008.

⁵ CSIRO and Australian Bureau of Meteorology (2007) *Climate Change in Australia- observed changes and projections*, p. 4.

⁶ CSIRO and Australian Bureau of Meteorology (2007) *Climate Change in Australia- observed changes and projections*, p. 5.

Greenhouse gases and their warming potential

Although Carbon Dioxide (CO₂) is often referred to in climate change information, it is only one of the greenhouse gases that contribute to global warming, about 60% of the total. CO₂ results from the combustion of oil, coal and gas, from the clearance of forests, and from cement manufacture.⁷

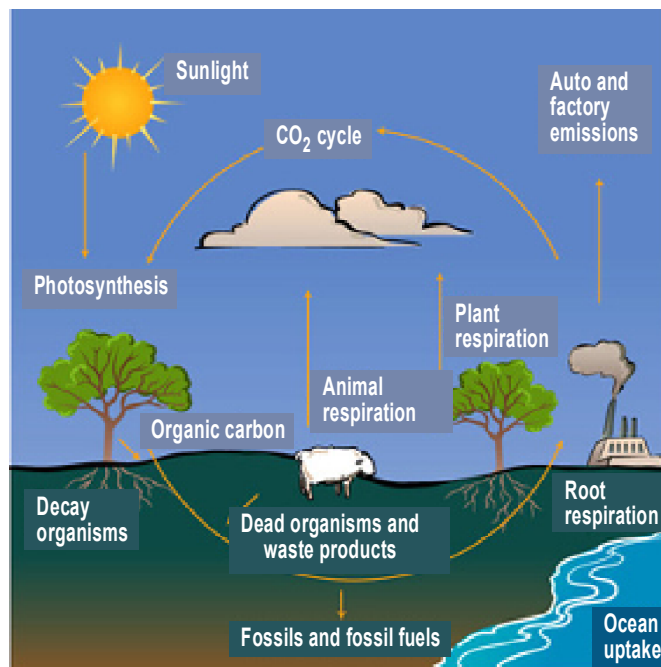
There are a range of other gases that also contribute to global warming, including Methane (CH₄), Nitrous Oxide (N₂O), Sulphur Hexafluoride (SF₆) and groups of gases known as Hydrofluorocarbons (HFCs), Hydrofluoroethers (HFEs), and Perfluorocarbons (PFCs).

These other gases are found in smaller amounts, but can be quite significant as they have a higher warming potential than CO₂. For example, Methane has 21 times the warming potential, Nitrous Oxide 310 times, and Sulphur Hexafluoride 23,900 times the warming potential of CO₂.⁸

The Carbon Cycle

Carbon, in various forms, continuously circulates between the living world, the atmosphere, oceans and the Earth's crust. There are many different processes by which carbon is exchanged between these locations. Events, such as fires, which release carbon dioxide into the atmosphere, are known as 'sources'. The oceans and growing trees remove carbon dioxide from the atmosphere and are known as 'sinks'.⁹

This is all part of the natural, short term cycle of carbon. Elements of the short term carbon cycle are not included in greenhouse gas accounting. The full carbon cycle, showing the short term and human induced elements are shown below.¹⁰



The short-term carbon cycle extends into the wine industry to include fermentation, emissions of CO₂ from waste water and landfill and sequestration into non-permanent structures and sources within the vineyard such as shoot growth. Emissions of CO₂ that arise directly from the combustion or degradation of biomass are treated as part of the short-term carbon cycle. This includes burning wood and other biomass as a fuel.¹¹

⁷ <http://www.climatechange.sa.gov.au/index.php?page=greenhouse-gases> accessed 20 November 2008.

⁸ Department of Climate Change (2008) *National Greenhouse Accounts (NGA) Factors*, available at <http://www.climatechange.gov.au/workbook/index.html>

⁹ Department of Climate Change (2007) *Climate Change Science Frequently Asked Questions*, available at <http://www.climatechange.gov.au/science/faq/index.html> accessed 19 November 2008.

¹⁰ <http://eo.ucar.edu/kids/green/cycles6.htm> accessed 12 December 2008.

¹¹ FIVS (2008) *International Wine Carbon Calculator Protocol Version 1.2*, p.18

Measuring emissions

In order to determine how much a product, individual or company is contributing to climate change, it is possible to measure the amount of greenhouse gases that are being emitted using greenhouse gas accounting. There are many different methods used, most of which are based on the International Greenhouse Gas (GHG) Protocol developed by the World Business Council for Sustainable Development and the World Resources Institute.

There are two ways of defining greenhouse gas emissions- direct and indirect. Direct greenhouse gas emissions arise from sources that are owned or controlled by the company. Indirect greenhouse gas emissions are classified as emissions that are a consequence of the activity of the company, but occur at sources owned or controlled by another company.¹²

In greenhouse gas accounting, direct and indirect emissions are further defined as Scope 1, 2 and 3. These definitions under the GHG Protocol are shown in Box 1.

Box 1: Definitions of Scope 1, 2 and 3 emissions¹³

Scope 1:

Direct GHG emissions

Scope 1 direct GHG emissions occur from sources that are owned or controlled by the company, for example, emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc.; emissions from chemical production in owned or controlled process equipment.

Scope 2:

Electricity indirect GHG emissions

Scope 2 accounts for GHG emissions from the generation of purchased electricity consumed by the company. Purchased electricity is defined as electricity that is purchased or otherwise brought into the organizational boundary of the company. Scope 2 emissions physically occur at the facility where electricity is generated.

Scope 3:

Other indirect GHG emissions

Scope 3 is an optional reporting category that allows for the treatment of all other indirect emissions. Scope 3 emissions are a consequence of the activities of the company, but occur from sources not owned or controlled by the company. Some examples of scope 3 activities are extraction and production of purchased materials; transportation of purchased fuels; and use of sold products and services.

Emissions are defined in these categories to avoid any double counting when undertaking greenhouse gas accounting. Emissions may be measured on an individual product in a life cycle analysis, which is all the emissions added up from cradle to grave, or at a company level, greenhouse gas accounting usually accounts for Scope 1 and 2 only.

Reporting of Scope 1 and 2 is the basis of most mandatory reporting systems and is what the Federal government is requiring through the National Greenhouse and Energy Reporting System (NGERS) (see further information on NGERS in the section on *What are we doing to tackle climate change in Australia?*).

Under the Wine Industry Sector Agreement (see *Information Sheet 2: Wine Industry Sector Agreement Overview*), emissions will be measured using the Australian Wine Carbon Calculator, which contains Scope 1 and 2 and selected Scope 3 factors. Wine industry participants will need to submit a report on their Scope 1 and 2 emissions, but Scope 3 will be optional and is more for information for the company to identify areas for emissions reduction in the supply chain.

¹²Florence (2006) in FIVS (2008) International Wine Carbon Calculator Protocol Version 1.2, p.13.

¹³World Business Council for Sustainable Development and the World Resources Institute (2004) *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard, Revised Edition*, p. 25.

What is the Australian Government doing to tackle climate change?

Some of the key elements of the Australian Government's Climate Change response are summarised here, but for more information on these initiatives and other climate change information and programs, see *Climate Change and the Wine Industry – Overview of Programs and Information, November 2008*, which forms part of this Information Package.

Carbon Pollution Reduction Scheme

The Australian Government is establishing a Carbon Pollution Reduction Scheme as part of an effective framework for meeting the climate change challenge.¹⁴

The White Paper on the Australian Carbon Pollution Reduction Scheme released by the Rudd Government on 15th December 2008 confirms Australia's commitment to a long-term goal of reducing Australia's greenhouse gas emissions to 60 per cent below 2000 levels by 2050.

It also establishes a medium-term target range to reduce emissions by between 5 and 15 per cent below 2000 levels by 2020.

While the top end of this mid-term range is unconditional, the commitment to a full 15 percent reduction requires both developed and developing countries to make similar commitments that are consistent with long term stabilisation of atmospheric concentrations of greenhouse gases at 450 ppm CO₂-e or lower.

The Carbon Pollution Reduction Scheme (CPRS) is a 'cap and trade scheme' where an overall cap on carbon pollution is set through issuing permits and entities have the ability to trade permits, ensuring carbon pollution is reduced at the lowest possible cost. The CPRS is due to commence in 2010.

National Greenhouse and Energy Reporting Framework

The *National Greenhouse and Energy Reporting Act 2007* (the Act) was passed on 29 September 2007 establishing a mandatory reporting system for corporate greenhouse gas emissions and energy production and consumption. The first reporting period under the Act commenced on 1 July 2008.

Key features of the Act are:

- Reporting of greenhouse gas emissions, energy consumption and production by large corporations.
- Public disclosure of corporate level greenhouse gas emissions and energy information.
- Consistent and comparable data available for decision making, in particular, the development of the Carbon Pollution Reduction Scheme.¹⁵

As part of the framework, Reporting and Technical Guidelines have been published by the Department of Climate Change to assist large corporations meet the requirements.

Australian Climate Change Science Program

The Australian Government supports a broad range of greenhouse science research activities, one of which is the Australian Climate Change Science Program.

The program aims to improve our understanding of the causes, nature, timing and consequences of climate change so that industry, community and government decisions can be better informed. The program is administered by the Department of Climate Change and conducted in partnership with leading science agencies, notably the CSIRO and the Australian Bureau of Meteorology.¹⁶

¹⁴<http://www.climatechange.gov.au/emissionstrading/index.html> accessed 18 November 2008

¹⁵<http://www.climatechange.gov.au/reporting/about.html> accessed 25 November 2008

¹⁶<http://www.climatechange.gov.au/science/accsp/index.html> accessed 25 November 2008



What is the South Australian Government doing to tackle Climate Change?

In June 2007 South Australia became the first Australian State – and the third jurisdiction in the world – to pass dedicated climate change legislation that includes a target to reduce our greenhouse gas emissions by at least 60 per cent of 1990 levels by the end of 2050. The *Climate Change and Greenhouse Emissions Reduction Act 2007* also commits the State to generating 20 per cent of its power needs from renewable sources such as solar and wind by 2014.

As of January 2009, South Australia is ahead of schedule to achieve the renewable energy target and also remains on track for the State's share of Australia's Kyoto Target for the period 2008-2012.

The State has complemented the climate change legislation with a range of other practical initiatives that have assisted in shaping the national agenda on climate change action. Examples include:

Extensive consultation during 2005-06 culminating in publication of 'Tackling Climate Change – South Australia's Greenhouse Strategy 2007-2020, in May 2007;

Demonstration solar power projects, including on Parliament House, the South Australian Museum and Art Gallery and in some 250 South Australian Schools throughout the State, and at the Royal Adelaide Show Grounds;

Introduction of the nation's first solar feed-in scheme that pays South Australian householders and small energy consumers using solar panels a premium tariff for electricity they put back into the grid;

Support for the development of wind and geothermal energy generation projects through streamlining of planning provisions and targeted financial support.

South Australia leads the nation in the development and use of renewable energy resources, with 58 per cent of Australia's installed wind power capacity and around 33 per cent of the nation's grid-connected solar photovoltaic capacity.

Members of the wine industry can do their bit to tackle climate change by participating in the Wine Industry Sector Agreement- attending their regional information sessions, signing the Participant Commitment and measuring and reporting their greenhouse gas emissions for 2009/2010 using the Australian Wine Carbon Calculator.

This will assist in identifying areas for reducing greenhouse gas emissions, and enable targeted reductions.

