



## Energy Conservation

Climate change threatens to destroy the natural resources upon which humans depend, impacting human health, the economy and biodiversity. With coal the major source of energy in Australia<sup>1</sup>, Australia's contribution to global warming is disproportionate to our population size<sup>2</sup>.

### The Problem

#### Energy and Climate change

84% of energy in Australia is produced by the burning of coal<sup>1</sup>, which releases carbon dioxide: a greenhouse gas. Excessive accumulation of greenhouse gases enhances the natural warming effect whereby gases trap energy from the sun. Global warming disrupts natural processes on Earth. Some examples include: rises in sea levels caused by the melting of ice caps; coral bleaching from increased water temperature; increases in catastrophic weather events; and prolonged droughts jeopardising water security, agriculture and biodiversity.

#### The Coal Economy

Australia is the world's largest exporter of coal contributing about 30% of global trade<sup>1</sup>. Whilst Australia's domestic consumption of coal contributes less than 0.5% of global emissions<sup>1</sup>, this is significant given our small population. Our role as the world's leading coal exporter implicates us in global emissions.

Australian mineral industries including aluminium production are economically powerful and energy intensive. About 10% of Australia's electricity capacity is used for aluminium production<sup>3</sup>. Bauxite must also be extracted, with mining requiring the burning of large amounts of coal and other fossil fuels.

The recent trend towards providing water security for Australian cities from energy-intensive desalination plants also has a significant global warming impact<sup>4</sup>.

#### Household Energy Consumption

Energy consumption in Australia has increased per person in recent years. Energy consumption is expected to rise further as more Australians live alone and householders are increasingly installing air conditioners to cool larger homes<sup>5</sup>.

#### Energy Policy

Scientists have known about climate change for decades but in recent years, energy security and climate change have become global priorities. The 2009 Copenhagen Conference resulted in a historic number of nations committing to action to reduce global warming and to assist developing nations adjust to climate change<sup>6</sup>.

The Australian Government has considered a range of energy policy measures including an emissions trading scheme. Such a scheme requires industry to buy permits in order to emit greenhouse gases. The number of permits issued is controlled such that a cap is placed on total emissions, with industry permitted to trade permits. In placing a price on carbon, industry is provided with an incentive to invest in clean technologies<sup>7</sup>.

Whilst they have deferred the emissions trading option, the Australian Government has committed to a Renewable Energy Target to increase the proportion of renewable energy to 20% of the energy market by 2020<sup>8</sup>.

There have also been incentive programs directed at householders including rebates for installation of solar energy and insulation<sup>9</sup>.

#### Did you know?

The coal export industry in Australia was worth \$22.5 billion in 2008<sup>1</sup>.

Japan received 44% of coal exported from Australia in 2006-2007<sup>1</sup>.

Australia is the world's fifth largest producer of aluminium<sup>3</sup>.

The number of Australian households is expected to rise to 61% of 1990 levels by 2020: an increase of almost 4 million households<sup>5</sup>.

Under the Renewable Energy Target, there will be as much energy produced from renewable sources by 2020 as electricity currently generated to power Australian households<sup>8</sup>.



## Energy Conservation

### The Solution

#### Renewable Energy Sources

Renewable energy sources can be harnessed indefinitely whereas coal and other fossil fuels are finite resources. Renewable energy sources include solar, wind, geothermal, hydro and biomass, although in Australia, most attention has focused around solar and wind energy.

**Solar:** Solar energy is the generation of electricity from sunlight, usually through photovoltaic cells.

**Wind:** Wind turbines extract kinetic energy from wind and convert it into electrical energy.

#### How to Conserve Energy

If you own your own home, consider installing insulation or investing in a solar hot water heater.

If you need to use air conditioning, avoid turning the thermostat on to very cold settings. When the system works harder, it uses significantly more energy.

Buy green power. Most energy suppliers give you the option of sourcing a proportion of your energy from renewable sources.

Check the star ratings on appliances. You will save money as well as energy.

#### Simple Tips to Conserve Energy

- switch off fridges that are not in use
- turn off power points at the source
- use cold water in the washing machine
- turn off lights when not in use

| Energy Sources |   |  |
|----------------|---|--|
| Type           | Advantages  | Disadvantages  |
| Coal           | Currently cheap because environmental costs are not reflected in prices | Contributes to global warming and air pollution                        |
|                |   | Requires mining of finite resources                                    |
| Solar          | No air pollution or contribution to global warming                      | High initial investment cost<br>Energy available when sun shining only |
|                | Energy source independent from markets                                  |  |
|                | Ability to sell excess power back to grid                               |  |
| Wind           | No air pollution or contribution to global warming                      | Wind turbines can be unattractive                                      |
|                | Energy source independent from markets                                  | Large tracts of land required for wind farms                           |
|                | Ability to sell excess power back to grid                               | Noise<br>Wind turbines represent a threat to birds                     |

#### References

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