



# responding to the challenge of climate change

## THE FACTS:

- By 2070 Victoria is likely to be 0.7 to 5.0C warmer than it was in 1990.
- Climate change could claim up to 37% of the world's species by 2050
- Global sea levels are projected to rise between 9 and 88 centimetres by 2100 compared with 1990
- In 2002 Victoria's per capita greenhouse gas emissions were 24.7 tonnes and Australia's per capita emissions were 28.2 tonnes. This is higher than any other developed country. Even the USA has lower per capita emissions.
- Over 90 per cent of electricity generated in Victoria is from coal-fired power. With current technology, this form of electricity generation accounts for over 50 per cent of the State's greenhouse gas emissions.
- The average Victorian household creates around 11.9 tonnes of carbon dioxide per year.
- Electrical appliances with the highest star-ratings could save the typical Victorian household up to \$100 every year on their electricity and water costs.
- Victorians now lead the nation in signing up to Green Power. Since March 2005 the number of Victorians joining Green Power has doubled and now accounts for 38 per cent of Green Power customers nationally.

*Victoria's goal is to play its part in international efforts to reduce greenhouse gas emissions and fight climate change.*  
Steve Bracks, Premier

*There is no bigger problem than climate change.  
The threat is quite simple, it's a threat to our civilization.*  
Professor Sir David King

Climate change is one of the greatest environmental threats the world is facing this century.

Victoria's emissions increased by 13.7 per cent between 1990 and 2004 to 123 million tonnes a year – meaning our emissions are now greater than many industrialised nations such as Austria and Switzerland.

Major businesses are now recognising the need for action – for example, the Australian Business Roundtable on Climate Change has recently called for Australia to adopt the target to reduce greenhouse gas emissions by 60 per cent below 2000 levels by 2050.

This proposal was supported by economic modelling done by the Allen Consulting Group and the CSIRO have confirmed that if early action is taken strong economic growth will be maintained.

Clearly we need to make coal cleaner, and shift to less greenhouse-intensive fuel, including natural gas, wind and solar power.

Victoria will continue to pursue alternative forms of clean energy and will remain a nuclear-free state. On the environmental front it is clear that nuclear power is not a viable greenhouse gas abatement option for Victoria.

Changing our energy mix won't happen overnight, but by taking action now we can provide a smooth transition to a low carbon economy and take advantage of economic opportunities.

The Government is investing heavily in emerging technologies such as carbon capture and storage of greenhouse gases, which offer solutions in the medium to long- term. Deep cuts won't be able to be made until existing energy supply technologies are replaced, or can be retrofitted with new, low emissions technologies. So in the next decade we need to support improvements in coal technology through to full commercialisation including coal drying, coal gasification and carbon-capture and storage (geosequestration) to meet growing energy demands with a range of low-emission alternatives.

We will also need to substantially increase renewable energy and make major energy savings through efficiency.

Energy consumption in Victoria (not including energy used for transport) has increased by 27 per cent over the period 1990 to 2004, and this in turn is increasing our greenhouse gas emissions. In the absence of adopting additional energy efficiency measures, it is expected that electricity consumption will increase by 1.4 per cent per year over the period 2006-2015.

Even if deep cuts in emissions are achieved through mitigation efforts and energy efficiency savings, the existing build-up of greenhouse gases in the atmosphere mean it is critical that we begin to prepare for and adapt to the consequences of climate change. Early action will improve our ability to manage future climate change and reduce the costs of remedial action.

CSIRO research indicates we will have to deal with a range of effects from climate change such as sea level rise, heat waves and more variable rainfall. In turn these changes may have a wide range of impacts - those identified to date include reduced milk production in cattle from heat stress, consideration of new crop varieties and the regions in which they are grown, and reductions in suitable habitat for native species such as the Mountain Pygmy Possum.

We need to start work now on making our agricultural systems and natural assets more resilient and helping regional communities deal with the consequences of climate change.

### **What we have done**

We have taken some important first steps to cutting greenhouse gas emissions, in our homes, workplaces and industry.

Victoria pioneered mandatory 5 Star water and energy efficiency standards for all new homes, and has helped 20,000 existing homes and small businesses switch to solar.

Over the past six years the Government has reduced its energy use by 15 per cent, saving \$17.5 million on power bills a year and providing savings in greenhouse emissions equivalent to taking 55,000 cars off the road.

EPA has implemented new licence requirements that will reduce industry greenhouse gas emissions. An independent 2006 assessment of the program projects that it will save over 500 Victorian businesses, which are large emitters of greenhouse gases, \$34 million every year by being more energy smart and cutting greenhouse pollution by over one million tonnes a year. The average payback period for business after investing in energy savings was 17 months.

The Government has helped a further 50 medium-to-large businesses save energy and money through innovation grants for new technology.

Three thousand homes for Victorians on low incomes have been retro-fitted to reduce energy bills, saving households around \$100 a year on power bills and making homes warmer in winter and cooler in summer.



We have been a major supporter of renewable energy and now have some of the biggest wind farms in Australia and a blade manufacturing plant in Portland. Over the past five years, Victoria's wind generation capacity has increased from less than 1MW to 104MW installed.

Our \$100 million *Victorian Greenhouse Strategy* is helping cut greenhouse gases through dozens of successful programs, from paying farmers to plant native trees, to supporting community initiatives like increasing household recycling and installing water efficient shower heads.

*Climate change: I say the debate is over.  
We know the science, we see the threat  
and we know that the time  
for action is now.*

Arnold Schwarzenegger,  
Governor of California

While we have lobbied hard for Australia to sign the Kyoto Protocol, in the absence of Federal support we have joined with other States and Territories to develop a National Emissions Trading Scheme. This would place us alongside Europe and other forward-thinking nations that are putting a market price on carbon.

Victoria is leading the charge on mandatory public reporting of greenhouse gas emissions by industry.

In 2004, we released *Adapting to Climate Change: Enhancing Victoria's Capacity* to research the impacts of climate change on key areas such as water, biodiversity, bush fires, communities, alpine regions and agriculture, so that we can better prepare for the inevitable changes in our climate.

The Government has also commissioned research by the CSIRO and others on the impacts of projected climate change for key sectors and regions in Victoria. This research has informed the Government's strategic planning in areas such as alpine resorts and water resources. Water authorities are now planning for climate change in their water supply-demand and regional strategies, while coastal vulnerability assessment has begun in Gippsland.

# action 1: clean greenhouse friendly energy

With growing acceptance that climate change is happening and that deep cuts in our greenhouse gas emissions are required, we need to rethink and redesign our energy supply system. This cannot occur overnight, but taking action early will enable us to make a smooth transition to a low-carbon future and position our economy for continued growth. To achieve change to support a sustainable energy supply system in Victoria, a range of policy drivers are needed and are being pursued by the Government.

## What we will do

### 1.1 Victorian renewable energy target

We will introduce legislation to lift Victoria's level of renewable energy from the current level of 4% up to 10% in 2016.

The Victorian Renewable Energy Target (VRET) will deliver a much needed boost to Victoria's renewable energy sector, and will trigger up to \$2 billion of new investment in renewable energy projects over the next 10 years. Under VRET, electricity retailers will be required to purchase an additional 3,274 gigawatt hours (GWh) of renewable energy by 2016. More than 1000 megawatts (MW) of renewable energy will be installed, reducing greenhouse gas emissions by more than 2.5 million tonnes per year, which is the equivalent of taking 600,000 cars off our roads each year.

Victoria is taking this strong leadership position following the failure of the Federal Government to expand its national Mandatory Renewable Energy Target (MRET) scheme. It will be the first time an Australian State has legislated a mandatory renewable energy scheme.

In 2002, we set our policy target for Victoria to reach a 10% renewable energy level by 2010 in the expectation that the Federal

Government would continue and extend its scheme. However, the Federal Government did not even accept the recommendation of its own Tambling Review to continue and extend the MRET scheme to 20,000 GWh by 2020.

Over the past five years, we have pursued our target of 10% renewable energy by 2010, and as a result Victoria's wind energy capacity has increased from less than 1MW to 104MW installed. In addition, the Victorian Government is encouraging consumers to purchase Green Power and is providing support for innovative renewable energy projects.

Without a market-based incentive scheme such as VRET, the renewable energy industry in Victoria would stall and investment would leave the State.

The Government will invest \$1.5 million to establish the scheme.

VRET will create up to 2200 new jobs in the renewable energy industry and up to \$2 billion in capital investment, mostly in provincial Victoria. VRET will cost the average Victorian household less than \$1 per month (starting in 2008) and will only increase an average household electricity bill by \$8 annually. The Bracks Government has recently announced cuts in average power prices for households and small businesses between \$33 and \$57 over the next 2 years.

VRET will continue until 2030 and reduce greenhouse gas emissions by 27 million tonnes over this period.

VRET will provide long-term support that will ensure the renewable energy industry in Victoria will continue to grow steadily into the future.

*It is now clear that we face a deepening global climate crisis that requires us to act boldly, quickly and wisely.*  
Al Gore, former Vice President of the United States

In addition to VRET, we will also continue to work towards our ambitious 10% renewable energy target as early as 2010, through a range of complementary measures to promote renewable energy in Victoria. These include further promotion of voluntary Green Power purchases by households and businesses in Victoria, solar power on houses, technology support and smart energy zones. These additional measures could add to our renewable energy capacity, taking the level of renewable energy as high as 12% by 2016.

*The Government's Renewable Energy Action Plan will be released shortly.*

### **1.2 Support for Renewable Energy Technology**

**We will increase support for the renewable energy sector with \$12.35 million for developing new technologies.**

The Renewable Energy Support Fund will be boosted by \$2.35 million in 2006/07, to support medium-scale technologies in factories and communities. This will mean more towns and businesses can generate their own power, reducing reliance on the national electricity grid.

We will invest a further \$10 million over three years to support renewable energy technology research and development. This will help drive technology in the fast-growing sustainable energy sector reach the commercialisation stage. Grants will be provided on merit to world-class research proposals that can leverage additional support from industry and the Commonwealth.

### **1.3 Support for National Emissions Trading**

**We will design a market-based emissions trading scheme for Australia so that we start giving business a market incentive to reduce greenhouse gas emissions.**

Until we start factoring the cost of greenhouse gases into our economy, we cannot begin the shift to a low-carbon future. That's why we are leading the work with other States and Territories for a National Emissions Trading Scheme (NETS) to give incentives for business and electricity generators to be more efficient. Emissions trading provides clear signals to electricity generators to reduce their greenhouse gas emissions in the most cost-effective way.

### **Carbon Disclosure Project**

The Carbon Disclosure Project (CDP), now in its fourth year, is expanding for the first time to ask Australia and New Zealand's largest companies to disclose information about their exposure and approach to climate change. The CDP facilitates a dialogue between shareholders and corporations about the business implications presented by climate change and encourages public disclosure of this information. The Victorian Government supports the CDP and its push for company response and disclosure and is supportive of the necessary measurement and analysis of greenhouse gas emissions that such reporting requires.

### **Emissions Trading Scheme**

Under an emissions trading scheme (ETS), a limit or 'cap' is placed on the level of greenhouse gases that can be emitted by businesses that are subject to the scheme. Businesses have the choice of operating within their cap either by reducing their emissions or by purchasing emissions permits from other businesses that are able to reduce emissions at a lower cost. In this way, an ETS provides flexibility for businesses and efficiency in the achievement of overall emissions reductions.



The Government will conduct further analysis and assessment of emissions trading scheme design options to ensure that the ETS can reduce greenhouse emissions in a way that also provides investment certainty and maintains the State's economic growth.

A joint State/ Territories Green Paper will be released shortly to allow all stakeholders to comment on the design of the scheme.

#### **1.4 Greenhouse reporting**

**We will keep pushing for all industry greenhouse gas emissions to be publicly reported, as an essential step towards an emissions trading scheme.**

Victoria has led a nationwide pilot with 25 Australian companies across 70 sites to show how a mandatory reporting scheme can work at a low cost to business and government.

We have been leading the charge for a cost-efficient, transparent and uniform measure of greenhouse gas emissions reporting to fight climate change. Our trial with leading companies found they could use the existing National Pollutant Inventory (NPI) mechanism to measure their emissions of six greenhouse gases and disclose the results to the community within existing reporting budgets. This evidence helped convince a recent meeting of Commonwealth and State Environment Ministers to draft changes to the NPI to include greenhouse gas emissions, with a final decision expected next year.

Victoria will continue to do all it can to push for national reporting and public disclosure of greenhouse gases.

#### **1.5 Cleaner coal**

**We will choose the successful tenderers for the \$103.5 million *Energy Technology Innovation Strategy*.**

In 2005, the Victorian Government announced the \$103.5 million *Energy Technology Innovation Strategy*.

This funding will help commercialise coal-drying, coal gasification and geosequestration technologies to dramatically reduce greenhouse gas emissions from brown coal electricity plants. The *Energy Technology Innovation Strategy* will make sure Victoria's industrial base stays competitive and we capitalise on Victoria's vast brown coal reserves.

Tenders for the clean coal projects have been received and the successful tenders will be announced shortly.

#### **1.6 Improving existing generators**

**We will work with existing generators to improve their greenhouse performance.**

Existing generators are required to apply best practice and continuously improve their environmental performance. Government will work with generators to clarify expectations and support them to improve.

*Until we start factoring the cost of greenhouse gases into our economy, we cannot begin the shift to a low-carbon future.*

### 1.7 Green communities

We will invest \$4 million over four years to show how leading Victorian communities can dramatically cut greenhouse emissions.

Solar Cities proposed for Coburg and Central Victoria aim to show how communities can generate their own power. The significant contribution local communities can make by integrating energy efficiency measures, smart meters, retail tariff incentives, solar panels and demand management is largely untapped. That's why we will create opportunities for Victorian communities to meet their own power needs.

We will support projects such as the sustainable energy projects being considered for the housing, retail and commercial precinct being developed at the former Pentridge Prison site in Coburg.

Another project aims to work with 13 local governments in central Victoria together with the Bendigo Bank and Origin Energy to develop an integrated and ambitious sustainable energy solution for the region.

Opportunities for further localised, sustainable energy generation will also be explored, including small scale wind and solar power projects for example in locations such as the redevelopment of the central Greensborough area and other locations identified as major "Activity Centres" in *Melbourne 2030*. These projects will be developed by local communities.

# action 2: improving our energy efficiency

Demand for energy in Victoria is continuing to increase and there is significant potential to reduce demand through energy efficiency measures. Saving energy through improved energy efficiency has been shown to be one of the most cost-effective ways that Victorians can cut greenhouse gas emissions in the past – and it will continue to be an important priority for the future.

## What we will do

### 2.1 Help for large resource users

**We will help big industrial users cut their water, energy and waste through mandatory efficiency audits.**

The Government will build on the success of EPA's Industry Greenhouse Program by introducing Environment and Resource Efficiency Plans for the State's 250 biggest energy and water users.

These companies will be required to prepare and implement Environment and Resource Efficiency Plans that include energy, water and waste reduction actions with a three-year or better payback period.

It is expected that this program will reduce greenhouse gas emissions by more than 1 million tonnes per year.

In addition, there will be a voluntary program for other large users through industry associations and targeted programs for key areas such as smaller commercial and industry resource users.

### 2.2 Smart metering

**We will spend \$2 million on pricing and metering trials using new technology to record how much power you use every 30 minutes and identify ways to save.**

For the last 100 years, standard household power meters have recorded the total energy used. We will speed up the roll-out of two-way interval meters over the next three-to-five years to two million homes so that Victorians can change their behaviour to save money and energy.

By knowing exactly how much energy you are using and at what price, you may choose to use energy-intensive appliances like air-conditioners and clothes dryers in off-peak times. Pricing trials will help retailers and consumers show how they could save money by reducing power demand in peak periods. Information gained from the trials could be used for future tariff pricing structures that reward people for saving energy.



### 2.3 Smarter energy pricing

**We will examine energy pricing regimes that give all Victorians an incentive to save energy.**

Appropriate energy pricing has the potential to complement other initiatives aimed at improving energy efficiency.

As part of *Our Water Our Future*, water pricing structures have helped save water without significant cost burden on consumers, especially low-income families.

The Government wants pricing regimes that encourage efficient resource use by businesses and households.

We will pursue energy pricing regimes that induce efficient resource use by businesses and households, including through improved pricing signals, and will examine options in consultation with energy retailers and consumer groups.

### 2.4 Greener appliances

**We will expand minimum energy standards to more appliances, including televisions and computers.**

Mandatory minimum energy performance standards (MEPS) set a bottom line for the amount of energy that can be used in particular appliances. As part of the *National Framework on Energy Efficiency*, the Victorian Government will support the accelerated development and roll-out of MEPS for key domestic appliances and commercial/industrial equipment. This will set new standards for television and home entertainment equipment, computers, chillers, heating, cooling and lighting.

We will also support the introduction of a fully national scheme for regulating the energy efficiency of gas appliances and equipment and give incentives for innovative energy efficient products.

### 2.5 Energy smart business

**We will invest \$2.5 million to demonstrate how business and retailers can be a lot smarter with energy and save money.**

Energy efficiency best practice demonstration projects will drive the wide spread uptake of best-practice by sharing the knowledge of how to make your business energy smart, which will save money and be more productive.

We will also start benchmarking Victoria's energy performance in key sectors of the economy, identifying key indicators as the basis for regular reporting. The focus will be on key business sectors, but we will also look at the residential sector and work with industry groups to spread the knowledge.

## 2.6 Better billing

We will collect and compare consumption data from similar households across a number of locations to give Victorians a better idea of how their energy use compares.

Currently we know very little about how similar households – in terms of size, age and type of housing – perform on the energy front. The Government will further investigate its energy data needs to determine whether any additional data is needed, particularly in relation to local government programs to reduce energy consumption.

We will also work with retailers to make energy bills more informative over time and help households save energy. This will enable Victorians to compare their power use with similar households, just like we do with our water bills. This is part of a National process to improve billing information.

## 2.7 Growing the energy efficiency industry

We will develop a suite of policies that will help Victoria attract jobs in energy efficiency.

More than 5,200 Victorians are employed in the sustainable energy industry, and approximately 90 per cent of these jobs relate to energy efficiency. A healthy and competitive energy efficiency services sector is essential for an efficient, low-emissions economy. We need to have the skills, technologies, advice and services in Victoria to support more business sectors and households to be more efficient.

## 2.8 Cities for climate protection

We will help local councils cut their greenhouse emissions with \$400,000 for climate change programs.

Victorian councils have been very pro-active in preparing for climate change with 61 councils joining the Cities for Climate Protection program. These councils have their own action plans to, for example, reduce energy and have green purchasing policies. This funding will help them achieve local goals.

*The Government's Energy Efficiency Action Plan will be released shortly.*

*More than 5,200 Victorians are employed in the sustainable energy industry, and approximately 90 per cent of these jobs relate to energy efficiency. A healthy and competitive energy efficiency services sector is essential for an efficient, low-emissions economy.*

# action 3: adapting to the impacts of climate change

24

Climate change will cause major changes to weather patterns around the world – some of these changes are already evident. Importantly, climate change will also have very localised and regional impacts. We need to better understand local impacts and develop strategies to learn to live sustainably in these changing conditions.

In order to cope with the impacts of climate change we need to adapt – these efforts should complement our activities to reduce greenhouse gas emissions to avoid dangerous levels of climate change.

## What we will do

We are committing \$14.8 million to prepare Victoria for the impact of climate change through the following four initiatives.

### 3.1 Adapting for Victoria's future

**We will increase our scientific knowledge and technical expertise to help communities adapt to climate change.**

Specifically, we will focus on five major issues:

- improving resilience of Victoria's natural assets to cope with more bushfire-risk, coastal erosion, flood control and stormwater infrastructure;
- making Victoria's agricultural systems resilient to climate change;
- making our buildings, infrastructure and homes more adaptable to climate change, such as heat stress;
- understanding what climate change will mean for the health of Victorians, especially the elderly, young and sick; and
- understanding what climate change will mean for individual communities in regions, so they can better prepare.

*Climate change will cause major changes to weather patterns around the world – some of these changes are already evident. Importantly, climate change will also have very localised and regional impacts. We need to better understand local impacts and develop strategies to learn to live sustainably in these changing conditions.*

### 3.2 Research centre for climate change adaptation

**We will establish a Centre of Research Excellence in climate change adaptation to put a real focus on our research efforts.**

This Centre will bring together expertise in social, economic, and biophysical science to work together on research, assessment and provision of multi-disciplinary advice to Government and the community.

The Government will set up the Centre to be consistent with other research efforts, including work being planned at a national level by the Council of Australian Governments. Options for the new Centre will include a virtual centre.

The Centre will vastly increase the Government's capacity to make better informed decisions about the Victoria-specific impacts of climate change, and incorporate adaptation to climate change into strategic planning processes.

The Centre will be complemented by an Adaptation Reference Council, which will work to build capability, advise on research priorities and align research activities in climate change impact assessment and adaptation capacity.

### 3.3 Local action

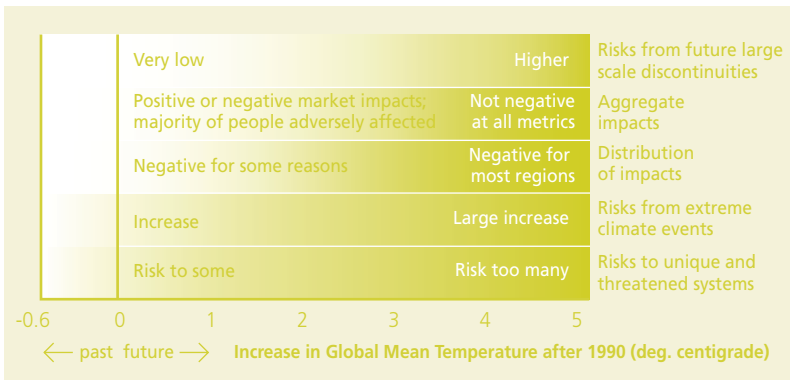
**We will update and assess the climate change vulnerabilities of every region in Victoria and keep communities in the picture.**

Regional assessments will pull together research across a range of fields to get the full social, environmental and economic impacts of climate change. For instance, water shortages will be assessed not only from the point of view of agricultural impacts, but the flow-on effects to communities, tourism and economic development. This will help Government determine regional land-use issues.

The Government will work with local government, regional groups and other stakeholders to build local understanding, while at the same time, keep communities informed with the most up-to-date, regionally specific information available that will help them develop local solutions.

Additional support will be given through regional government offices to help rural industries and communities take early action, such as developing vegetation corridors to protect natural heritage.

> Impacts of or risks from climate change, by reason for concern



### 3.4 Human health and climate change

We will assess the potential public health impacts on Victorians arising from climate change, such as heat waves.

We are only beginning to understand the impacts climate change could have on our health. That's why we need to assess the range of implications for our emergency and health care services and identify priority areas for action.

One such priority is responding to heat waves. We will develop a Victorian Heat Wave Emergency Plan, involving communities and local government, to assist emergency planning and responses. Victoria will also host a national conference in the first half of 2007 on climate change and human health.