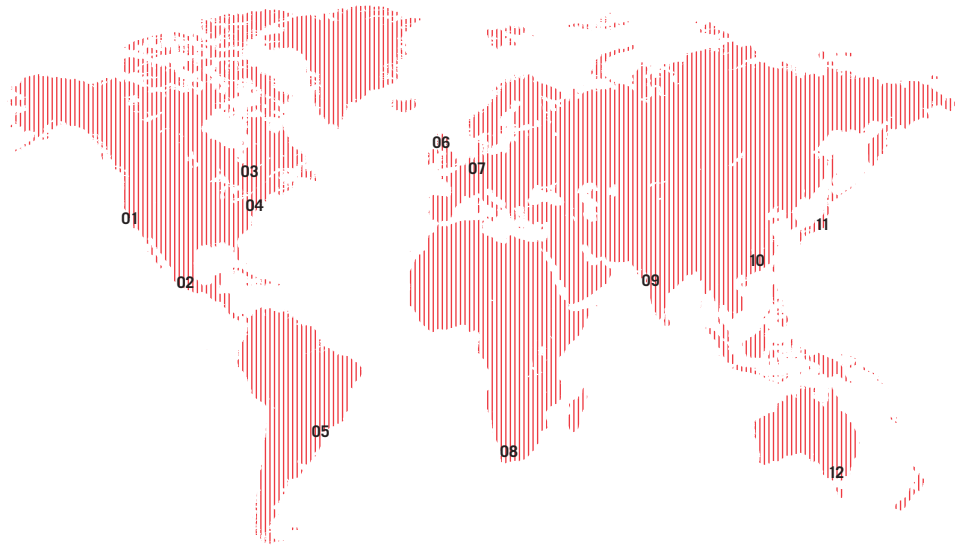


**LOW CARBON  
LEADER:  
STATES AND  
REGIONS**





## CONTENTS

### STATES AND REGIONS FROM WEST TO EAST

- 01: CALIFORNIA
- 02: MÉXICO
- 03: QUÉBEC
- 04: REGIONAL GREENHOUSE GAS INITIATIVE
- 05: SÃO PAULO
- 06: SCOTLAND
- 07: NORTH RHINE-WESTPHALIA
- 08: WESTERN CAPE
- 09: MAHARASHTRA
- 10: GUANGDONG
- 11: TOKYO
- 12: VICTORIA

## FOREWORD

Climate change is the greatest challenge facing the world today. The scientists are now certain that greenhouse gas emissions from human activity are the major contributing factor to climate change.

While we all need to act to confront this challenge, responsibility should be divided equitably amongst global nations and rest most heavily on those best-placed to influence the action needed to reduce global emissions. It is therefore vital that governments at all levels demonstrate the leadership that can lever this global action.

State and regional governments around the world are already responding to this challenge and are fast becoming an essential and effective part of the movement to combat climate change. Sub-national governments, many of whom have globally significant economies in their own right, can also have a globally significant impact on climate change mitigation due to their unique position of influence on their citizens and national governments.

An increasing number of sub-national governments have adopted targets to reduce greenhouse gas emissions. Sometimes these targets are linked to the emissions reduction commitments pledged by their national governments under the Kyoto Protocol, but they are often more ambitious. Many have also developed comprehensive strategies to underpin and deliver the targets they have set, a demonstrable sign of their commitment.

But the real challenge for state and regional governments, and perhaps the most significant indicator of leadership, is the implementation process. Making a real difference means driving the policies forward to deliver the emissions reductions necessary to meet the strategic objectives and targets.

The 12 case studies outlined in this Low Carbon Leader publication show that states and regions across the six continents of the world are making considerable progress. We have highlighted specific initiatives and projects to enable the sharing of experiences and encourage replication and scale-up. The examples show a vast range of activities undertaken to tackle climate change, including regulatory, market and fiscal measures across most industry sectors. Many of these measures will deliver not only environmental benefits but also financial benefits, both to the individual consumer and the wider economy. Some initiatives require partnerships to assist with financing and/or in knowledge and technology transfer. A further exciting development is that neighbouring states have started to collaborate with one another, amplifying the emissions reductions that can be achieved.

Although the key drivers for policies and strategies may differ between regions (for example, improving air quality, tackling energy shortages or limiting climate change impacts), I am confident that the resulting good practice will inspire and spur further state, regional, national and international action on climate change.

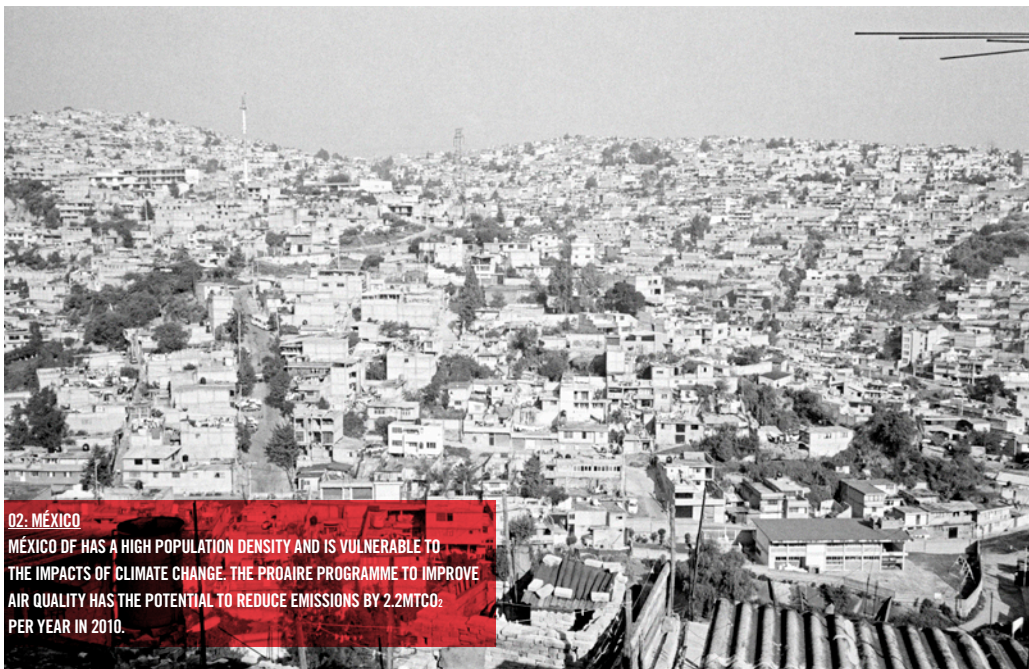
The Climate Group's Climate Alliance, launched last year in Nairobi, will help catalyse state and regional action and encourage wider partnership and engagement. Through our meetings with state and region leaders at the UNFCCC COP 13, we intend to build the Climate Alliance into a worldwide network of State and Regional Leaders to drive forward climate solutions among sub-national governments around the world.

**STEVE HOWARD, CEO, THE CLIMATE GROUP**

STATE / REGION / PROVINCE / LAND	KEY POLICIES/STRATEGIES	TARGETS	PROGRESS/BENEFITS
<b>01 CALIFORNIA</b> – Population: 36,132,000 (2005) – Area: 411,049 km <sup>2</sup> – GRP: US\$1.88 trillion (2005)	<b>The Global Warming Solutions Act (AB 32) 2006</b> – The first enforceable state-wide programme in the US to cap all GHG emissions from major industries; – A programme of regulatory and market mechanisms.	– Reduce GHG emissions to 2000 levels by 2010; – Reduce GHG emissions to 1990 levels by 2020 (an estimated 174MtCO <sub>2</sub> e reduction, 25% below business-as-usual); – Reduce GHG emissions to 80% below 1990 levels by 2050.	– Early Action measures adopted; – Estimated US\$4 billion in income generated by 2020; – Estimated increase in GRP of US\$60 billion by 2020; – Estimated 103,000 new jobs created by 2020.
<b>02 MÉXICO</b> – Population: 8,721,000 (2005) – Area: 1,479 km <sup>2</sup> – GRP: US\$183.12 billion (2006)	<b>México DF Local Strategy for Climate Action 2006</b> – A GHG emissions inventory and scenarios to 2012; – Analyses of vulnerability to climate change and adaptation options; – Mitigation measures in energy, transport, industry, domestic, waste and forestry sectors.	– No targets set.	– Not documented.
<b>03 QUÉBEC</b> – Population: 7,546,000 (2006) – Area: 1,700,000 km <sup>2</sup> – GRP: C\$284.16 billion (2006) (US\$298.26 billion)	<b>Québec and Climate Change Action Plan 2006-2012 ‘A Challenge for the Future’ 2006</b> – Mitigation measures in energy, transport, industry, waste, agriculture and public sectors; – Initiatives to raise public awareness and support R&D; – Adaptation measures for health, environment and natural resources.	– Reduce GHG emissions by 13.8MtCO <sub>2</sub> e, 6% below 1990 levels by 2012.	– Not documented.
<b>05 SÃO PAULO</b> – Population: 40,443,000 (2005) – Area: 248,809 km <sup>2</sup> – GRP: R\$591.6 billion (2004) (US\$338.35 billion)	<b>São Paulo State Programme for Climate Change (PROCLIMA) 1995</b> – Collaboration with the federal government to prepare the national emissions inventory; – Initiatives to raise public awareness through information and promotion of seminars, conferences and capacity development.	– No targets set.	– Develops and produces the national inventory for methane and transport emissions.
<b>06 SCOTLAND</b> – Population: 5,117,000 (2006) – Area: 77,925 km <sup>2</sup> – GRP: UK£86.3 billion (2006) (US\$178.36 billion)	<b>Scotland’s Climate Change Programme ‘Changing Our Ways’ 2006</b> – Policies and mitigation measures in the energy; transport; agriculture, forestry and land-use; business; domestic; public; and waste management sectors.	– Reduce CO <sub>2</sub> emissions to 20% below 1990 levels by 2010 (UK Climate Change Programme) and exceed this by 1MtC (9.9MtCO <sub>2</sub> total) below 1990 levels by 2010; – Reduce CO <sub>2</sub> emissions to 60% below 1990 levels by 2050.	– Devolved policies introduced since the Scottish Climate Change Programme was first published in 2000 are estimated to reduce emissions by about 9.5MtCO <sub>2</sub> .
<b>07 NORTH RHINE-WESTPHALIA</b> – Population: 18,058,000 (2005) – Area: 34,083 km <sup>2</sup> – GRP: €489 billion (2005) (US\$705.56 billion)	<b>The Energy and Climate Protection Policy of North Rhine-Westphalia 2005</b> – Initiatives on energy efficiency, renewable energy, biomass and energy research in the business, transport, domestic and agriculture sectors.	– Reduce energy consumption to 20% below 2006 levels by 2020; – Increase the share of renewables in electricity supply from 2% in 2006 to 12.5% by 2010 and 20% by 2020 (100TWh).	– Reduction of GHG emissions by about 31MtCO <sub>2</sub> annually through cross-sectoral policies; – Estimated 23,500 new jobs created by 2020.
<b>08 WESTERN CAPE</b> – Population: 4,839,800 (2007 estimate) – Area: 129,370 km <sup>2</sup> – GRP: US\$35.72 billion (2006 estimate)	<b>A Status Quo, Vulnerability and Adaptation Assessment of Physical and Socio-Economic Effects of Climate Change in the Western Cape 2005</b> – Historical trends and climate projections; – Impacts on water and terrestrial ecosystems and socio-economic sectors; – Identification of adaptive strategies.	– Not documented.	– Not documented.
<b>09 MAHARASHTRA</b> – Population: 96,752,000 (2005) – Area: 307,577 km <sup>2</sup> – GRP: Rs.1.87 trillion (2004) (US\$42.25 billion)	<b>Maharashtra Strategic Energy Conservation Plan 2005</b> – 11 energy conservation programmes in the domestic, public, business and agricultural sectors.	– No targets set.	– Estimated total costs are Rs.29.79 billion (US\$758.21 million); – Estimated energy saving benefits are Rs.100 billion (US\$2.55 billion); – Estimated energy savings of over 20,000GWh, and capacity savings of over 1,000MW by 2012.
<b>10 GUANGDONG</b> – Population: 83,040,000 (2005) – Area: 177,900km <sup>2</sup> – GRP: ¥2.60 trillion (2006) (US\$348.30 billion)	<b>Mid- and Long-Term Energy Conservation Plan for Guangdong (2006-2010)</b> – Seven programmes in the business, domestic, power and public sectors aimed at reducing energy intensity and developing the principle of a circular economy.	– Reduce energy intensity to 15,611MJ per US\$1,000 (16% reduction on 2005 price); – Reduce energy intensity by 18% on 2005 price in cities on Pearl River Delta.	– Not documented.
<b>11 TOKYO</b> – Population: 12,678,000 (2005) – Area: 2,102 km <sup>2</sup> – GRP: ¥83,630 billion (2003) (US\$728.3 billion)	<b>Tokyo Climate Change Strategy 2007</b> – Initiatives in energy, business, finance, domestic, construction and transport sectors; – Initiatives to raise public awareness.	– Reduce GHG emissions to 25% below 2000 levels by 2020.	– Not documented.
<b>12 VICTORIA</b> – Population: 5,023,000 (2005) – Area: 237,629 km <sup>2</sup> – GRP: A\$228.20 billion (2006) (US\$210.02 billion)	<b>Victorian Greenhouse Strategy 2002 and Victorian Greenhouse Strategy Action Plan Update 2005</b> – Measures and quantitative targets in the energy, industry, waste, transport, natural resources, agricultural, public and domestic sectors.	– Reduce GHG emissions to 60% below 2000 levels by 2050; – Increase renewable energy generation from 4% in 2006 to 10% by 2016 and increase renewable and low emissions energy generation to 20% by 2020.	– Estimated annual GHG emissions reduction of 5-8.3MtCO <sub>2</sub> from 2008-2012.

STATES	REGIONAL GREENHOUSE GAS INITIATIVE	TARGETS	PROGRESS/BENEFITS
<b>04 TEN NORTHEAST AND MID-ATLANTIC US STATES: CONNECTICUT, DELAWARE, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, RHODE ISLAND AND VERMONT.</b> – Population: 48,769,935 (2006 estimate) – Area: 241,667.22 km <sup>2</sup> – GRP: US\$2.49 trillion (2006)	– A regional mandatory cap-and-trade programme covering CO <sub>2</sub> emissions from electric-generating units that burn more than 50% fossil fuel with a capacity of 25MW or larger; – The first compliance period starts on 1 January 2009.	– Regional emissions will be capped at approximately 1990 levels of 110MtCO <sub>2</sub> through to 2015; – Regional emissions will be reduced to 10% below 1990 levels by 2019.	– Memorandum of Understanding signed and model rule adopted; – States are in the process of issuing draft regulations; – Estimated annual regional revenue from auctioned emissions budget allowances of US\$50 million – 185 million to 2020 will be used to support consumer benefits, e.g. energy efficiency, renewable energy and rebates; – Estimated positive effect on GRP due to investment in energy efficiency and cleaner technologies.

US\$ currency conversions calculated on 31 October 2007



**02: MÉXICO**  
MÉXICO DF HAS A HIGH POPULATION DENSITY AND IS VULNERABLE TO THE IMPACTS OF CLIMATE CHANGE. THE PROAIRE PROGRAMME TO IMPROVE AIR QUALITY HAS THE POTENTIAL TO REDUCE EMISSIONS BY 2.2MTCO<sub>2</sub> PER YEAR IN 2010.

## 01: CALIFORNIA

**CARBON FOOTPRINT:** 496.95 MILLION TONNES CO<sub>2</sub>e (2004)

As the 12th largest emitter of carbon dioxide (CO<sub>2</sub>) in the world in 2006, California recognises its responsibility to reduce its emissions. With the fifth largest economy in the world, the state is well positioned to take action. By doing so it can lead the United States – and the world – in developing the innovative policies and implementing the technologies needed to avoid the most dangerous consequences of climate change.

The State of California has committed to reduce its greenhouse gas (GHG) emissions to 2000 levels by 2010, to 1990 levels by 2020, and 80% below 1990 levels by 2050. The 2020 target reductions are currently estimated to be 174MtCO<sub>2</sub>e, 25% below business-as-usual emissions levels. Other states in the US have set GHG emissions reduction targets but California has gone further by making its 2020 target legally binding.

The California Global Warming Solutions Act of 2006 (AB 32) represents the first enforceable state-wide programme in the US to cap all GHG emissions from major industries. It is a comprehensive programme of regulatory and market mechanisms to achieve quantifiable, cost effective reductions of GHGs. It requires the Air Resources Board to establish state-wide GHG reporting and to monitor and penalise non-compliance with the programme.

To meet the 2020 target, existing policies, such as California's vehicle emissions standards and renewable energy and energy efficiency requirements will make a significant contribution, but additional policies will be essential. In June 2007, California's Market Advisory Committee released its final report and recommendations for the design of a GHG cap-and-trade system.

The state's top energy modellers and economists anticipate that Gross State Product could increase by US\$60 billion and 103,000 jobs could be generated in California if the state meets its goals for 2020.

## 02: MÉXICO

**CARBON FOOTPRINT:** 36.2 MILLION TONNES CO<sub>2</sub>e (2006)

México Distrito Federal (México DF) is one of the largest developing city-states in the world with a fast growing economy (4.5% annual growth projected to 2020). México DF has a high population density and is therefore vulnerable to the adverse impacts of climate change such as higher temperatures, droughts and floods.

To respond to the health and environmental issues caused by air pollution, the 2002-2010 Programme to Improve Air Quality in the Valley of México Metropolitan Area, known as PROAIRE, has the potential to reduce emissions by 2.2MtCO<sub>2</sub> per year in 2010. Another programme established in 2002 – EMBARQ, a public-private partnership between México DF and the World Resources Institute – implements new sustainable transportation solutions for México City, and is estimated to reduce emissions by 35,000tCO<sub>2</sub>e annually.

Despite the successes of these programmes, México DF's carbon footprint increased by 8.1% between 2004 and 2006. Consequently, the Local Strategy for Action on Climate Change was launched, which set up an institutional framework aiming to reduce GHG emissions by improving the use of natural resources without compromising future economic growth.

Among developing country states, this strategy leads as an example of an integrated and comprehensive approach to tackling climate change. A thorough GHG inventory was compiled with three possible scenarios for 2012. Vulnerability as well as adaptability were analysed, especially in terms of risk for the population and the costs involved. Although México DF Government has not committed to any specific targets, several mitigation options applicable to specific sectors have been evaluated. Some of these projects, particularly in the transport sector, are already being implemented. Furthermore, México DF hopes to achieve some of these initiatives through the Clean Development Mechanism.



**03: QUÉBEC**  
QUÉBEC'S GOAL TO INCREASE THE USE OF PUBLIC TRANSPORT BY 8% BY 2012 WILL BOOST THE NUMBER OF TRIPS ON PUBLIC TRANSPORT BY 40 MILLION PER YEAR.

## 03: QUÉBEC

**CARBON FOOTPRINT:** 89.4 MILLION TONNES CO<sub>2</sub>e (2005)

Québec, the second most populated province in Canada (7.5 million people in 2006), had the country's lowest CO<sub>2</sub>e emissions rate per capita in 2003 with an average of 12.1 tonnes. The province owes its relatively low GHG emissions to the significance of renewable energy in its energy mix. Hydro-electricity accounts for 94% of the total power generation, and therefore electricity represents only 1.7% of Québec's carbon footprint. The quota of renewables will increase by 10,000MW of wind and hydro-electric power to be implemented by 2015, in line with the 2006 Energy Strategy. Major contributing sectors to Québec's total GHG emissions are transport (37.4%) and industry (31.1%).

### **FACT:** **QUÉBEC'S CLIMATE CHANGE ACTION PLAN WILL REDUCE ITS GREENHOUSE GAS EMISSIONS BY 13.8MTCO<sub>2</sub>e, 6% BELOW 1990 LEVELS BY 2012**

For Québec, combating climate change fits closely with ensuring economic prosperity and sustainable development for its population. Cleaner technologies, more renewables and greater energy efficiency are fundamental to accelerating the pace towards a low carbon economy. To that purpose, Québec released a climate change action plan for 2006-2012 aiming to reduce GHG emissions by 10MtCO<sub>2</sub>e. In addition to the C\$1.2 billion (US\$1.28 billion) budget dedicated to it by the Government of Québec, the Canadian Government granted C\$350 million (US\$373.01 million) under the Canada ecoTrust, which will enable another 3.8MtCO<sub>2</sub>e reduction. This will allow Québec to reduce its GHG emissions by 13.8MtCO<sub>2</sub>e, 6% below 1990 levels.

Transport is a key element of Québec's climate change policy. 75% of the total budget will be spent on transport-related actions, which will reduce GHG emissions by more than 4MtCO<sub>2</sub>e. This will be achieved through a comprehensive and original mix of measures including regulation, fiscal incentives, targeted research and development (R&D), infrastructural reorganisation and behavioural change campaigns.

As an example, Québec plans to adopt a regulation to require manufacturers of light-duty vehicles sold in Québec to meet a GHG emissions standard starting in 2010. This measure, inspired by the standard California introduced in 2004, could decrease GHG emissions in new vehicles sold by 30% to 1.7MtCO<sub>2</sub>e by 2012.

The Government of Québec will also spend a substantial amount of its climate change budget in encouraging the development and use of public transportation around the province. With a budget of C\$720,000 (US\$767,083), the 'Québec Public Transit Policy' aims to augment mass transit by 8% in 2012 by increasing the modal share of mass transit compared with the use of private vehicles. Around 28 million litres of fuel could be saved, which would reduce GHG emissions by 80,000tCO<sub>2</sub>e. The positive impact on reducing road congestion would also generate annual savings of C\$44 million (US\$46.88 million).

These measures, together with others in the climate change action plan will be financed through an innovative duty levied on fossil fuels. This levy, unique in North America, will be charged to energy distributors operating within the province. It will be calculated on the basis of the level of CO<sub>2</sub>e emissions released by each form of fossil fuel, which, for instance, will result in the levy on natural gas being lower than the one on heavy fuel oil.



**04: REGIONAL GREENHOUSE GAS INITIATIVE**  
**REGIONAL GREENHOUSE GAS INITIATIVE SETS A CAP ON EMISSIONS OF CO<sub>2</sub> FROM ELECTRIC-GENERATING UNITS THAT BURN MORE THAN 50% FOSSIL FUEL WITH A CAPACITY OF 25MW OR LARGER.**

## 04: REGIONAL GREENHOUSE GAS INITIATIVE

At the end of 2006, 34 of the 75 largest GHG emitters in the world were US States. Over the past few years, US State programmes addressing climate change and specifically GHG emissions reductions have proliferated. One of the most significant of these programmes is the joining together of northeast and mid-Atlantic states to develop the first mandatory US cap-and-trade programme known as the Regional Greenhouse Gas Initiative (RGGI).

In 2003, the then New York State Governor George Pataki initiated the RGGI process by sending a letter to the governors of the northeast and mid-Atlantic states inviting them to work together “to develop a strategy that will help the region lead the nation in the effort to fight global climate change”. Since then, state representatives have been working to develop the programme, which relies on a flexible, market-based approach to curb power plant emissions, whilst also promoting greater energy efficiency and energy independence.

In 2005, after a two-year design process and extensive stakeholder input, RGGI was established by the governors of seven northeast and mid-Atlantic states: Connecticut, Delaware, Maine, New Hampshire, New Jersey, New York, and Vermont. Currently, ten states have signed up as Massachusetts, Rhode Island and Maryland joined in 2007.

RGGI sets a cap on emissions of CO<sub>2</sub> from electric-generating units that burn more than 50% fossil fuel with a capacity of 25MW or larger and allows sources to trade emissions allowances. Regional emissions will be capped at approximately 1990 levels of 110MtCO<sub>2</sub> through to 2015, and then reduced to 10% below this level by 2019. Compared to the emissions increases the region would see from the sector under a business-as-usual scenario, RGGI will result in an approximately 35% reduction by 2020.

The first compliance period begins on 1 January 2009. Each state will receive an emissions budget, although the cap will apply regionally across all participating states. Emissions will be reported annually but there will be a three-year compliance period to allow weather-related spikes in emissions to be smoothed out.

**“STATES ACROSS THE NATION ARE TAKING ACTION TO CUT GREENHOUSE GAS EMISSIONS AND REDUCE THEIR IMPACT ON THE ENVIRONMENT. THIS IS A NEW APPROACH AND ONE THAT SHOULD BE REPLICATED AT THE FEDERAL LEVEL”**

**GOVERNOR ELIOT SPITZER, NEW YORK STATE**

Companies will have to buy allowances through an auction for every tonne of CO<sub>2</sub> they emit. A minimum of 25% of each state’s emissions budget allowances will be sold in the market. New York, Maine and Massachusetts have published their regulations, which call for an auction of 100% of allowances. The proceeds from the auction will be used to support consumer benefits such as energy efficiency, renewable energy and consumer rebates. This is projected to produce annual regional revenue of between US\$50 million and US\$185 million through to 2020.

Offset credits for Certified Emissions Reductions (CERs) or carbon sequestration projects may be used for compliance up to a limit equivalent of 3.3% of a source’s emissions in any compliance period. Offsets in the RGGI region will be awarded offset credits for CERs on a 1:1 tonne basis. Offsets for the rest of the US will only be awarded one allowance for every two tonnes of CERs. Eligible offsets include afforestation, end-use energy efficiency, landfill gas recovery, and methane capture from farming facilities.

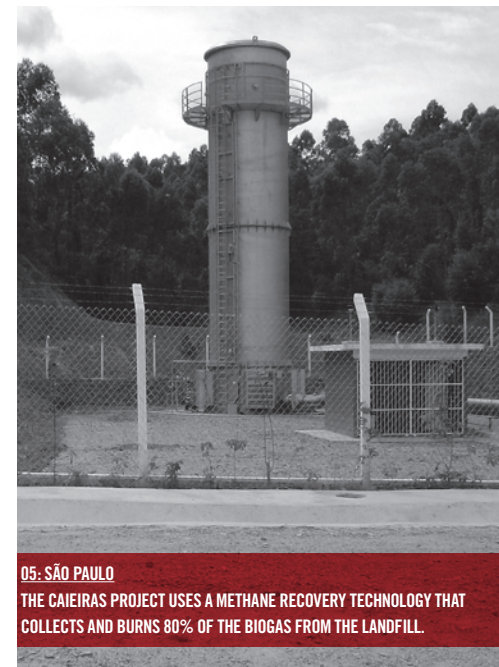
There are ‘safety valves’ in place designed to ensure that the cost of allowances remains

affordable. For example, if the average annual price of an emission allowance were to rise above US\$7 or US\$10, sources will be permitted to use offsets for up to 5% or 10% respectively of a plant’s reported emissions. By allowing offsets to account for a greater percentage of emissions, the programme will keep energy prices low while also achieving real emissions reductions.

Projected retail electricity price impacts would be modest, ranging from an increase of 0.3-0.6% in 2015, which is US\$3-16 per average household annually. Improvement in end-use energy efficiency over time is projected to produce average household bill savings that significantly exceed the price impact of the RGGI programme.

Best estimates have also predicted a positive effect on Gross Regional Product, with an increase of 0.01-0.02% by 2015. This is due primarily to the impact of investment in energy efficiency and cleaner technologies.

The states will monitor progress on an ongoing basis, with a comprehensive review examining all aspects of the programme scheduled for 2012. Ultimately, the programme may be expanded to include additional sectors and other GHGs or could indeed serve as a model for a national GHG cap-and-trade programme.



**05: SÃO PAULO**  
**THE CAIEIRAS PROJECT USES A METHANE RECOVERY TECHNOLOGY THAT COLLECTS AND BURNS 80% OF THE BIOGAS FROM THE LANDFILL.**

## 05: SÃO PAULO

**CARBON FOOTPRINT: 83 MILLION TONNES CO<sub>2</sub>e (2003) <sup>(Excludes LULUCF)</sup>**

At present, developing countries have no legal obligations to constrain their GHG emissions. However, they are able to contribute to global emissions reductions by hosting projects under the Kyoto Protocol’s Clean Development Mechanism (CDM). At the end of October 2007, Brazil had 112 registered CDM projects, reducing emissions by 17,386,960tCO<sub>2</sub>e annually. This ranks Brazil third in the world, behind China and India.

One particular landfill gas emissions reduction project in Caieiras, São Paulo, is being developed by Essencis São Paulo, and the Japanese company JPower Development. The project collects the biogas produced from the decomposition of organic matter in the landfill, and converts it into electricity for local use. The project started in March 2006 and over its lifetime of 19 years is expected to reduce fugitive emissions from the landfill by 20,251,860tCO<sub>2</sub>e. This activity would not be feasible without the revenue generated from Annex 1 countries purchasing the CERs to comply with their emissions targets.

In the absence of the CDM project, the landfill would practise the passive venting and direct burning at wellheads for safety reasons, which would destroy a maximum of 20% of biogas produced by the landfill. The Caieiras project is using a new, for Brazil, methane recovery technology, which collects and burns 80% of the biogas from the landfill.

Besides the GHG emissions reductions, Essencis has also voluntarily proposed to allocate 2% of the value of its net proceeds from the sale of CERs to activities that will benefit the local community, environment and economy. Local industries are also interested in buying the biogas for electricity generation, bringing further revenue to the project and allowing investment into new and more efficient technologies in the state of São Paulo and beyond.

# REGIONS STATES AND LEADERS: CLIMATE

Leadership at the state and regional government level is fast emerging as one of the most important levers in the worldwide effort to combat climate change. In countries where the commitment to climate change policies at national level is slow to emerge, regional governments are both a 'policy laboratory' and a political driver of action. In other countries with more ambitious climate and energy goals, action by sub-national governments is complementing that of national government and helping to accelerate moves towards a low carbon economy.

In many parts of the world, state and regional governments control much of the carbon infrastructure, from energy to transport, and have powers to develop policies including implementing emissions trading schemes. A growing number of sub-national governments are making significant commitments and taking action, both individually and with neighbouring states. Many have adopted targets for emissions reductions, either linked to or beyond the reduction commitments of their federal governments: these include states as diverse as California, Florida, Ontario, North Rhine-Westphalia and South Australia.

Several other regional governments are developing strategies, policies and measures to drive down emissions. Québec's Climate Change Action Plan, Scotland's Climate Change Programme and Tokyo's Climate Change Strategy are just three of many examples.

**“CLIMATE CHANGE THREATENS OUR PEOPLE, OUR ECONOMY, OUR SOCIETIES, AND OUR VERY EXISTENCE. IT CAN ONLY BE TACKLED IF WE ALL WORK TOGETHER – IN THIS PARLIAMENT, IN SCOTLAND, IN THE UK, AND ACROSS THE WORLD”**

**JOHN SWINNEY MSP, CABINET SECRETARY FOR FINANCE AND SUSTAINABLE GROWTH**

States in North America have collaborated locally to develop joint initiatives, focusing in particular on emissions trading. A prime example is the Regional Greenhouse Gas Initiative (RGGI) which involves a number of the northeast and mid-Atlantic US States. Another is the Western Climate Initiative which involves the US States of Arizona, California, New Mexico, Oregon, Utah and Washington and the Canadian Provinces of British Columbia and Manitoba.

But action is not limited to states and regions in the developed world. As this publication shows, states in China, India, Africa and South America are all taking steps to reduce emissions at the same time as they grow their economies.

All of these actions contribute to the fight against climate change. This contribution can be significantly enhanced through wider partnership and collaboration between sub-national governments. When states and regions seize

the opportunities to learn from one another's experiences, and develop programmes and policies jointly, their actions can have a much greater impact.

**“THE WESTERN CAPE WILL BE ONE PROVINCE THAT WILL FACE SOME OF THE BIGGEST CLIMATE CHANGE CHALLENGES IN THE COUNTRY. WE CANNOT SIT BACK AND WAIT FOR IT TO HAPPEN, WE NEED TO RESPOND... CLIMATE CHANGE PRESENTS RISKS TO US, BUT WE BELIEVE WHEN DEALING WITH STRATEGIES TO ADDRESS AND MITIGATE, THERE ARE ALSO OPPORTUNITIES”**

**TASNEEM ESSOP, WESTERN CAPE MINISTER OF ENVIRONMENT, PLANNING AND ECONOMIC DEVELOPMENT**

The leadership shown by states and regions at UNFCCC COP 11 in Montréal in 2005 was instrumental in focusing attention on the opportunities for sub-national governments to make a vital contribution to the challenge of climate change. The Montréal Declaration, which emerged as a defining feature of the Climate Summit, showed the commitment of states and regions to rise to this challenge. The Declaration commits those that have signed it to set short- and long-term emissions reduction targets and to adopt a range of solutions including: energy efficiency improvements in buildings; the use and promotion of cleaner and greener forms of energy; market mechanisms; consumer equipment and appliances; sustainable mobility; new industrial processes and technologies; sustainable agriculture and forestry including maintaining healthy biological sinks; R&D; and better waste management.

Building on this solid foundation, The Climate Group brought together state and regional leaders at UNFCCC COP 12 in Nairobi in 2006, where they agreed to work together through a Climate Alliance to turn the commitments made in Montréal into firm actions.

The examples showcased in this publication are just a small part of the wide-ranging and often groundbreaking actions being taken by states and regions: a clear sign that they truly are the laboratories of the low carbon economy.



**06: SCOTLAND**  
SCOTLAND'S LARGE AREA OF RURAL LAND, ORGANIC-RICH SOILS, AGRICULTURE AND FORESTRY CONTRIBUTE TO GHG EMISSIONS, BUT ALSO HAVE A ROLE IN REMOVING AROUND 8% OF EMISSIONS THROUGH THEIR CARBON SINK FUNCTION.

## 06: SCOTLAND

**CARBON FOOTPRINT: 54.52 MILLION TONNES CO<sub>2</sub>e (2005)**

Scotland's emissions are falling. Between 1990 and 2005, GHG emissions fell by around 16% from 64.4 to 54.5MtCO<sub>2</sub>e. As part of this reduction, CO<sub>2</sub> emissions fell by 12.5% – almost double that of the UK average decrease of 6.4%. This reduction in emissions was achieved at the same time as a 36% growth in Scotland's economy.

The highest emitters in Scotland are the energy, transport and business sectors, currently accounting for around three-quarters of Scottish emissions. Since 1990, energy supply emissions have fallen by 10% and business emissions have fallen by 22%. However, in line with the rising trend in Europe, Scottish transport emissions have increased by 11%.

The Scottish Government has set itself an ambitious goal in tackling climate change. It plans to set a statutory target for Scotland to reduce emissions by 80% below 1990 levels by 2050, and to develop mechanisms to ensure regular progress is made. To give effect to this target, the Scottish Government will be consulting on a Scottish Climate Change Bill in early 2008, which is expected to be introduced later in the year. The UK Government plans to introduce a similar Bill which would require a mandatory 60% reduction in emissions below 1990 levels by 2050 in the UK, with an intermediate target of 26-32% cut by 2020. Both Bills are designed to provide a long-term legal framework, which will provide business and investors with the certainty needed to plan for a low carbon economy. The Bills will also propose a requirement that Ministers are held to account in the event of failure to meet emissions reductions, with mandatory annual reporting to both the Scottish and UK Parliaments.

Scotland's Climate Change Programme, published in 2006, sets out the existing policies being pursued to reduce emissions and adapt to climate change. To meet the ambitious targets set out by the Scottish Bill, new policies and delivery mechanisms will be needed. Whilst the

target may be long-term, the actions to achieve it are required now. Scotland will need to take advantage of and build on its particular strengths.

Scotland's enormous natural resources present an opportunity for global leadership in harnessing renewable energy. It is committed to supporting a wide range of renewable technologies including wave and tidal, on- and off-shore wind, and hydrogen and fuel cell technology. The European Marine Energy Centre in Orkney provides testing facilities for the development of several full-scale prototypes. Support schemes are in place to encourage the use of biomass energy and the uptake of small-scale renewables at domestic and community levels. Steps to develop the market for renewable heat are also under way.

**“CLIMATE CHANGE WILL BE AT THE HEART OF OUR ECONOMIC DECISION MAKING. THE BILL WILL PROVIDE A FRAMEWORK FOR OUR INDUSTRIES TO INVEST WITH CERTAINTY IN WORLD-BEATING, LOW CARBON TECHNOLOGIES”**

**JOHN SWINNEY MSP, CABINET SECRETARY FOR FINANCE AND SUSTAINABLE GROWTH**

Land-use is important in the Scottish context. A large area of rural land, organic-rich soils, agriculture and forestry contribute to emissions, but also have a role in removing around 8% of emissions through their carbon sink function. To maximise this natural sequestration, the Scottish Rural Development Programme encourages climate-friendly management practices.

Local authorities in Scotland are also committed to tackling climate change and showing leadership. All 32 have signed a Climate Change Declaration, which commits them to action to reduce GHG emissions and adapt to the unavoidable impacts of climate change.



**07: NORTH RHINE-WESTPHALIA**  
TO ACHIEVE ITS RENEWABLE ENERGY TARGETS, NRW WILL INVEST IN TECHNOLOGIES WITH THE MOST POTENTIAL IN TERMS OF PRICE AND GENERATION AND IN THOSE WHICH IT ALREADY HAS SIGNIFICANT EXPERTISE SUCH AS WIND POWER.

## 07: NORTH RHINE-WESTPHALIA

**CARBON FOOTPRINT: 222.12 MILLION TONNES CO<sub>2</sub> (2004)**

North Rhine-Westphalia (NRW) is the westernmost and – in terms of population and economic output – the largest of Germany's Länder. NRW is the country's industrial heart, with steel and manufacturing traditionally developed on abundant resources of coal. NRW established a powerful energy sector, providing 30%, and consuming 40%, of national energy production.

Developing a climate change and energy strategy is vital for NRW to mitigate against the impacts of rising fuel prices and to establish a secure energy supply. There is also the need to comply with the European Union Emissions Trading Scheme (EU ETS) given that almost a quarter of German facilities covered by the EU ETS are in NRW, accounting for 57% of NRW's CO<sub>2</sub> emissions. NRW also sees developing the strategy as a great opportunity to provide a framework for fostering climate protection and helping Germany reach its Kyoto target, whilst also maintaining and gaining a competitive edge based on skills and expertise which have proven successful in generating value.

In 2005, NRW released the next steps of its Energy and Climate Protection Policy, developed around four strategic plans. The strategy aspires to capitalise on NRW's strengths and expertise in the field of energy and to ensure NRW's leadership both nationally and internationally.

The energy efficiency campaign 'NRW Saves Energy' aims to optimise industrial production processes and improve energy efficiency in buildings. The target for the campaign is to save 20% of primary energy consumption. As part of the campaign, NRW is developing an innovative initiative intending to fill the gap where no incentive exists to reduce energy consumption and carbon emissions. Through a pilot programmatic Joint Implementation (JI) project, small- and medium-sized companies, which are not covered by regulatory obligations like the EU ETS, can implement energy efficiency and emissions reduction measures that will be valued

on emissions trading markets and become a source of income. The NRW Energy Agency will co-ordinate and manage the projects, which are likely to take place mostly in steam production and heat production processes in industry, manufacturing and public facilities. The reduction potential for the programmatic JI project will be 250MtCO<sub>2</sub> by 2012.

The NRW 'Renewable Energy Plan' intends to increase the proportion of renewables in the energy mix from 2% in 2006 to 12.5% by 2010 and 20% by 2020. To achieve this, investment will be focused on technologies with the most potential in terms of price and generation and on those which North Rhine-Westphalia already has significant expertise such as biomass and wind power.

**FACT:**  
**THE NORTH RHINE-WESTPHALIA 'RENEWABLE ENERGY PLAN' AIMS TO INCREASE THE PROPORTION OF RENEWABLES IN THE ENERGY MIX FROM 2% IN 2006 TO 12.5% BY 2010 AND 20% BY 2020**

The third programme focuses on biomass and plans to double its generation capacity in heat and electricity, as well as its use as a transport fuel thus boosting the forestry and agricultural sectors in the Land.

Finally, NRW has set up an ambitious Energy Research Programme aiming to make NRW the leader in this research field by 2015. The research would mainly concentrate on storage for renewable energy and carbon capture and storage from power plants.

## 08: WESTERN CAPE

**CARBON FOOTPRINT: 30.54 MILLION TONNES CO<sub>2</sub>e (2004)** (Excludes LULUCF)

The Western Cape Government is the first in South Africa to have commissioned a Climate Change Response Strategy and Action Plan. The strategy identifies key risk areas and makes recommendations on the priority adaptation and mitigation measures that can be enacted. Western's Cape's methodology for developing the strategy is outlined below and is an exemplary model.

1. Climate science analysis: this requires the use of climate and socio-economic models to assess the potential impacts in the province. Western Cape experience: the future climate of the Western Cape is likely to be warmer, drier and windier than at present. Some of these predicted trends are already evident with severe droughts and floods becoming more frequent.

2. Stakeholder engagement: discussions are advised with government, civil society, community-based organisations, development agencies and businesses to identify the key issues and priorities. Western Cape experience: this provides the forum for developing the communications strategy and awareness campaigns that are essential to support effective implementation of the programmes.

3. International best practice and literature review: this would facilitate the assessment of countries and regions that face similar bio-physical and/or socio-economic challenges to the Western Cape. Western Cape experience: possible partnerships were identified with Peru, Chile, Western Australia, California, Morocco and Queensland, which can assist the province to leapfrog certain research and assessment processes and deal more robustly and cost effectively with climate change risks and opportunities.

4. A response options matrix: both mitigation and adaptation response options are grouped on a sectoral basis. Risk and vulnerability assessments based on political, economic, social, technological, legal and environmental indicators (PESTLE analysis) facilitate the prioritisation of options. Western Cape experience: the options matrix was used to filter around 280 possible actions to just 40.

### WESTERN CAPE'S APPROACH AND METHODOLOGY TO DEVELOPING A CLIMATE CHANGE STRATEGY AND ACTION PLAN

STEP 1: CLIMATE SCIENCE ANALYSIS

STEP 2: STAKEHOLDER ENGAGEMENT

STEP 3: INTERNATIONAL BEST PRACTICE AND LITERATURE REVIEW

STEP 4: A RESPONSE OPTIONS MATRIX

CLIMATE CHANGE STRATEGY AND ACTION PLAN

## 09: MAHARASHTRA

**CARBON FOOTPRINT: 110 MILLION TONNES CO<sub>2</sub>e (2005)**

Maharashtra is one of the largest states in India and the leading industrial state. However, investments in power generation, transmission and distribution have not been able to keep up with the fast pace of economic growth. This has resulted in an electricity sector characterised by problems of inadequate capacity, poor quality and reliability. While it will be difficult to solve the chronic inadequacies in electricity supply, a major contribution can be made to reducing the supply-demand imbalance through the improvement of energy efficiency.

**FACT:**  
**MAHARASHTRA'S 11 ENERGY CONSERVATION PROGRAMMES WILL RESULT IN ENERGY SAVINGS OF OVER 20,000GWH, CAPACITY SAVINGS OF OVER 1,000MW, AND FINANCIAL SAVINGS OF APPROXIMATELY RS. CRORES 10,000 (US\$2.55 BILLION)**

The State of Maharashtra became the first in the country to develop an Energy Conservation Plan in 2005. It was prepared by the Maharashtra Energy Development Agency (MEDA) in partnership with the US Agency for International Development. The aim of the Plan is to develop a comprehensive blueprint and provide leadership in establishing and promoting the energy conservation ethic within government agencies and all consumer classes in the State of Maharashtra. It also seeks to maximise the participation of the private sector in its implementation. Other Indian states have expressed interest in the approach, including Andhra Pradesh, Gujarat and Delhi.

MEDA has developed 11 energy conservation programmes covering domestic, public, small- and medium-sized enterprises, commercial and agricultural sectors. The projects include high efficiency lighting, water pumping, motor rewinding and solar water heating technologies. It is estimated that in ten years, the 11 programmes will result in cumulative energy savings of over 20,000GWh, capacity savings of over 1,000MW, and financial savings of approximately Rs. Crores 10,000 (US\$2.55 billion).

The Maharashtra Energy Conservation Fund will be set up to assist in the financing of qualified energy efficiency projects within the state. The fund will stimulate the market implementation of an energy efficiency infrastructure that includes energy service providers such as Energy Service Companies (ESCOs). ESCOs are helpful in assisting various sectors to develop and implement cost effective energy efficiency projects. Such projects will improve the efficiency of energy systems, reduce dependence on energy imports, increase productivity and reduce GHG emissions.



### 10: GUANGDONG

**THE PEARL RIVER DELTA ATTRACTS MANY OF THE MAJOR ENERGY USING COMPANIES IN GUANGDONG. IN 2005, THE 'ONE THOUSAND COMPANIES' CONSUMED 627.67TWH, 43.4% OF THE PROVINCE'S TOTAL ENERGY CONSUMPTION, AND ACCOUNTED FOR EMISSIONS OF APPROXIMATELY 175MTCO<sub>2</sub>e.**

## 10: GUANGDONG

**CARBON FOOTPRINT: NOT DOCUMENTED**

Guangdong is the richest and second most populous province in China, with a GRP of ¥2.60 trillion (US\$348.30 billion) and a population of 83.04 million. It has faced some severe energy shortages over the past decade and can only self-supply one-quarter of its energy needs. This, as well as water shortages, acid rain and smog are putting a heavy burden on Guangdong's people and economy.

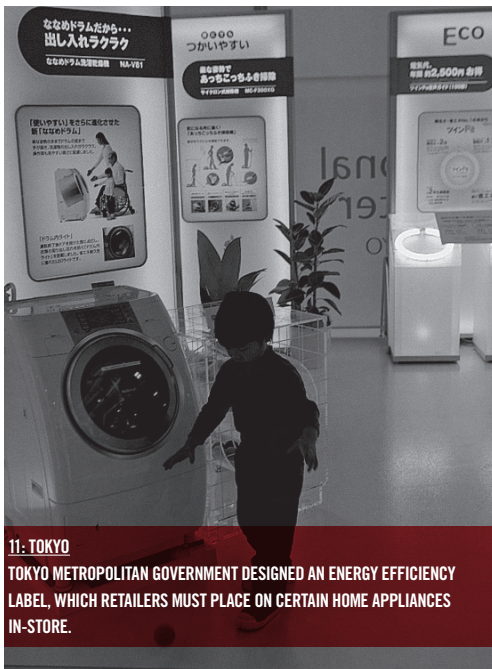
In reaction to these energy and environmental threats, the province has adopted an approach which will maintain its thriving economy but in a more sustainable direction. In order to attain this objective, Guangdong places great emphasis on improving energy efficiency and is already the least energy-intensive province in China (35.2% below national average). It has launched a significant set of energy saving initiatives targeting the industrial and construction sectors, and the Provincial Government.

**FACT:**  
**GUANGDONG PLACES GREAT EMPHASIS ON IMPROVING ENERGY EFFICIENCY AND IS ALREADY THE LEAST ENERGY-INTENSIVE PROVINCE IN CHINA, 35.2% BELOW THE NATIONAL AVERAGE**

The Mid- and Long-Term Energy Conservation Plan for Guangdong has established ten major programmes aiming to save about 45MtCO<sub>2</sub>e between 2005 and 2010. Major energy using companies, referred to as the 'One Thousand Companies', consumed 627.67TWh in 2005, 43.4% of Guangdong's total energy consumption, and accounted for emissions of approximately 175MtCO<sub>2</sub>e. These companies could potentially save 23MtCO<sub>2</sub>e through energy saving measures and technological innovations.

Other initiatives include a 'Building Energy Saving Campaign', in which Guangdong anticipates a saving of about 13MtCO<sub>2</sub>e by halving energy consumption in domestic and public buildings, for example by upgrading air conditioning systems and deploying improved technologies and products. Government buildings could also achieve a 20% reduction in electricity consumption, as well as a 20% decrease in energy intensity (measured both per square foot and per capita). A 'Green Lighting Campaign' aims to reach annual electricity savings of about 260 million KWh by switching one million incandescent light bulbs to compact fluorescent lamps.

Beyond its efforts to reduce energy consumption, Guangdong is also at the forefront of an innovative reorganisation of its economy. Following the principles of a circular economy, new assessment indicators and guidelines for new developments will reconcile economic development and environmental performance. The economy will be reorganised so that it can optimise the flows of materials and energy by creating integrated industrial parks and resource-conserving residential areas. In this regard, the City of Shenzhen in Guangdong is a pioneer in promoting and assessing circular economy projects. The city has adopted 'Regulations for Promoting Circular Economy of Shenzhen Special Economic Zone' and 37 demonstration projects have already been approved in various sectors such as industry, energy and construction.



**11: TOKYO**  
TOKYO METROPOLITAN GOVERNMENT DESIGNED AN ENERGY EFFICIENCY LABEL, WHICH RETAILERS MUST PLACE ON CERTAIN HOME APPLIANCES IN-STORE.

## 11: TOKYO

CARBON FOOTPRINT: 64 MILLION TONNES CO<sub>2</sub>e (2005)

One of the principal policy aims of the Tokyo Metropolitan Government (TMG) is to become a world-leading model for the drastic reduction of CO<sub>2</sub> emissions throughout the entire Metropolitan administration. However, Tokyo's CO<sub>2</sub> emissions are currently rising with energy consumption in the commercial and domestic sectors increasing by about 38% and 18% respectively between 1990 and 2003. In the domestic sector, this has been attributed to the growth in single-occupancy households and the widening range and uptake of consumer electronics. The energy efficiencies and amount of associated CO<sub>2</sub> vary significantly from product to product.

**“THE TOKYO METROPOLITAN GOVERNMENT WILL TAKE THE LEAD IN RAISING CONCRETE INITIATIVES TO CREATE A MOVEMENT FOR IMPROVEMENT OF THE GLOBAL ENVIRONMENT THAT INVOLVES INDIVIDUALS, CORPORATIONS AND VARIOUS OTHER ENTITIES. THIS WILL BE USED TO PUSH THE NATION INTO TAKING ACTION”**  
SHINTARO ISHIHARA,  
GOVERNOR OF TOKYO

In 2002, TMG launched its ‘Stop Global Warming from Tokyo Strategy’. As part of this strategy, TMG introduced a programme to increase citizens’ awareness about energy conservation, popularise energy saving home appliances and promote the development of energy saving technology. In collaboration with about 150 stores, TMG conducted a ‘Less Energy Consuming Product Promotion Campaign’ and designed an energy efficiency label for some home appliances.

The label includes a clear description of the energy saving performance of the home appliance. The degree of achievement of the applicable energy efficiency standard (expressed by star grades from one to five, with five stars being the highest standard), the annual electricity consumption and annual running cost enable the consumer to make an informed choice when purchasing the appliance.

By law, retailers must place this label on the relevant products displayed in-store. The products currently covered by the specific regulation (the revised Tokyo Metropolitan Environmental Security Ordinance) are air conditioners, refrigerators and television sets.

In 2003, a similar project was launched in the City of Kyoto. In 2004, TMG, Kyoto City Government and other local governments in co-operation with Non-Governmental Organisations (NGOs), the Akihabara electronics quarter and universities, established uniform standards and a steering committee to conduct the energy efficiency labelling campaign.

The Energy Efficiency Labelling System of Home Appliances has now been introduced in 23 prefectural areas throughout the country, including the eight local governments in Kanto district (Saitama Pref., Chiba Pref., Tokyo, Kanagawa Pref., Yokohama City, Kawasaki City, Chiba City and Saitama City).

Based on these efforts, the Japanese Government has revised the Law Concerning Rational Use of Energy and introduced a voluntary energy efficiency labelling system in October 2006. TMG has implemented the new law, but has not adopted its voluntary approach to labelling, preferring to continue with its own mandatory requirements.

## 12: VICTORIA

CARBON FOOTPRINT: 121.87 MILLION TONNES CO<sub>2</sub>e (2005)

Victoria may be Australia’s smallest mainland state in area, but it is the most densely populated and urbanised in the country. Established in 1970, Victoria’s Environment Protection Authority (EPA) is the second oldest environmental regulator in the world. EPA implemented the ‘polluter pays’ principle more than 35 years ago, which has helped to improve the Victorian environment dramatically.

**“IN ORDER TO PROVIDE PRACTICAL SUPPORT TO COMPANIES INTERESTED IN TACKLING CLIMATE CHANGE, WE KNEW THAT ENVIRONMENT PROTECTION AUTHORITY VICTORIA NEEDED TO EXPERIENCE THE CHALLENGES OF GOING CARBON NEUTRAL OURSELVES, FIRST HAND”**  
MICK BOURKE, CHAIRMAN,  
VICTORIA ENVIRONMENT  
PROTECTION AGENCY

EPA works with Victorian businesses to understand the risks and opportunities associated with environmental issues such as climate change. EPA helps companies recognise that early action not only delivers improved environmental outcomes, but also places the business in a stronger position to take advantage of future economic conditions.

EPA made the decision to act on reducing its own carbon footprint. After reviewing globally accepted best practice for carbon neutrality, EPA adopted the Greenhouse Gas Protocol, developed by the World Resources Institute and the World Business Council for Sustainable Development, to quantify its own GHG inventory. It was recognised early in the process that EPA needed to develop a decision-making framework to aid GHG management decisions.

The resulting Carbon Management Principles provide a step-by-step guide that can be applied to maximise environmental outcomes, and drive business benefit in relation to energy and carbon management.

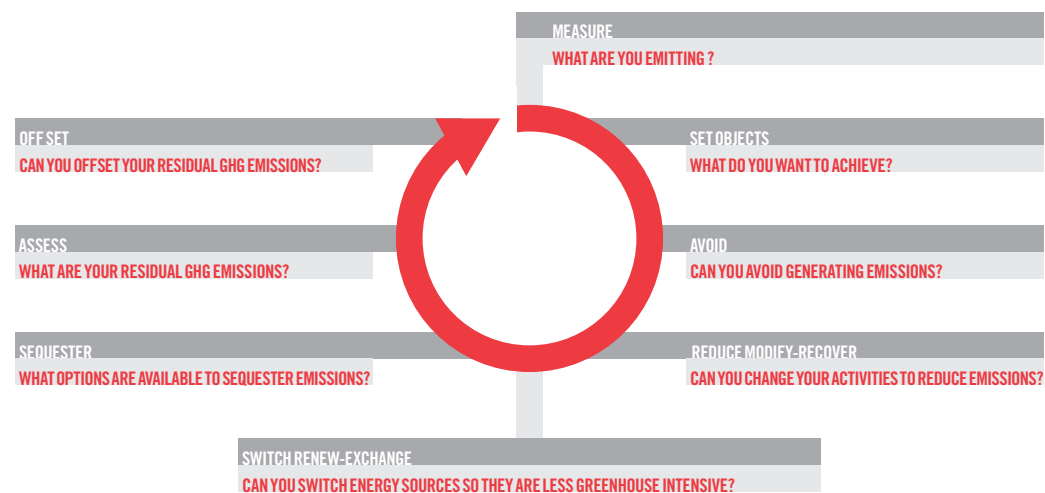
EPA approached making itself a carbon neutral organisation by tackling cost effective direct emissions reduction projects first, prioritising those with the most attractive financial payback periods. After reducing energy consumption by 41% over four years, EPA’s 2005-06 carbon emissions totalled 4,509tCO<sub>2</sub>e. Indirect emissions from purchased electricity for office power and heating were the main contributors.

EPA then considered the purchase of green power and offsets. EPA chose to increase its purchase of accredited green power from 28% to 100% and then offset remaining emissions by investing in a diverse portfolio of carbon offset products. Additional carbon credits were also purchased to cover any calculation uncertainties.

To address the lifecycle impacts of its operations, EPA has committed to include two new emissions sources to its GHG inventory each year. The 2006-07 inventory includes office paper and water, resulting in a GHG footprint of approximately 4,520tCO<sub>2</sub>e (currently undergoing verification). EPA is committed to achieving a 10% reduction on its 2005-06 energy-related GHG emissions by 2010, and at a minimum, implementing measures with a four-year or less payback period.

Since EPA has reached carbon neutrality, it has set its sights much higher, recognising that the biggest opportunities to reduce GHG emissions in the state will come from working with the businesses of Victoria. To help stimulate discussion and share knowledge, EPA established the Carbon Innovators Network. The Network provides practical and strategic assistance to help businesses address the risks associated with their carbon emissions. Members of the network including some of Australia’s leading companies in the financial and industrial sectors, are encouraged to contribute to the development of Network resources such as EPA’s Carbon Management Principles and carbon offset website.

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## GLOSSARY

### CAP-AND-TRADE

An emissions trading scheme that sets an overall limit on the emission of a certain pollutant and allows participating entities to trade emission allowances.

### CARBON NEUTRALITY

A balance between the amount of carbon released and the amount sequestered from a specific entity, project, product or process. It can refer to reducing the quantity of greenhouse gases released from burning fossil fuels, e.g. by reducing energy use; implementing energy efficiency measures; using renewable energy; carbon offsetting by funding carbon projects that remove or sequester greenhouse gases; and/or buying carbon credits to retire them through carbon trading.

### CARBON FOOTPRINT

A carbon footprint is the total amount of CO<sub>2</sub> and other greenhouse gases emitted over the full life cycle of a product or entity. The definition for this publication is the total net (i.e. including land-use, land-use change and forestry – LULUCF) amount of greenhouse gases emitted by the entity.

### CARBON OFFSETTING

The act of mitigating greenhouse gas emissions by purchasing credits from an investment fund or carbon development company that has aggregated the credits from individual carbon projects.

### CDM

Clean Development Mechanism. Defined in Article 12 of the Kyoto Protocol, the CDM allows industrialised countries with emissions reduction targets to invest in emission reducing projects in developing countries and take credit for any emissions reduced.

### CERS

Certified Emission Reductions. Carbon credits issued for emissions reductions achieved by Clean Development Mechanism projects.

### CO<sub>2</sub>e

Carbon dioxide equivalent. A unit, measured in tonnes, that allows emissions of non-CO<sub>2</sub> greenhouse gas emissions to be expressed as if they were CO<sub>2</sub> emissions, using global warming potential coefficients to make the conversion.

### CLIMATE ALLIANCE

The Climate Group launched the states and regions Climate Alliance at the UNFCCC COP 12 in 2006 to take forward the commitments made by sub-national governments in the Montréal Declaration. The Alliance will focus on practical solutions to climate change, in particular sharing best practice on effective policy implementation.

### EU ETS

European Emissions Trading Scheme. The world’s largest multi-national greenhouse gas emissions trading scheme commence on 1 January 2005.

### GHG

Greenhouse gas. A group of gases that absorb and re-emit infra-red radiation. These gases occur through both natural and human-influenced processes and include: carbon dioxide, nitrous oxide, methane, sulphur hexafluoride, hydrofluorocarbon, and perfluorocompounds.

### GREEN POWER

A term to describe a renewable or clean energy source.

### GRP

A measure of the size of a region’s economy, defined as the market value of all final goods and services produced within a metropolitan area in a given period of time.

### GWh

Gigawatt hour. A gigawatt corresponds to a billion (10<sup>9</sup>) watts in power capacity, and gigawatt hours describes the amount of power in gigawatts generated over one hour.

### JI

Joint Implementation. An arrangement under the Kyoto Protocol allowing industrialised countries with a greenhouse gas reduction commitment to invest in emission reducing projects in another industrialised country. A Programmatic Joint Implementation project is one where the emissions reductions are achieved by multiple actions in multiple geographic locations.

### LULUCF

Land-use, land-use change and forestry.

### MW

Megawatt of power (one million watts).

### Mt

Million tonnes (metric).

### NATURAL SEQUESTRATION

The term describing natural processes that remove CO<sub>2</sub> from the atmosphere. A carbon sink is a reservoir, e.g. plants or oceans, which remove CO<sub>2</sub> from the atmosphere.

### R&D

Research and development.

### THE MONTRÉAL DECLARATION

A declaration signed by regional governments from around the world in 2005 at the UNFCCC COP 11, to continue efforts to fight climate change through new and emerging initiatives that build a sustainable economy while reducing greenhouse gases.

### TWh

Terawatt hours. A terawatt corresponds to a thousand billion (10<sup>12</sup>) watts in power capacity, and terawatt hours describes the amount of power in terawatts generated over one hour.

### UNFCCC COP

The United Nations Framework Convention on Climate Change. Adopted on 9 May 1992 and signed at the Earth Summit in Rio de Janeiro by more than 150 countries and the European Community. Its ultimate objective is the ‘stabilisation of greenhouse gas concentration in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.’ The Convention entered into force in March 1994. The Conference of Parties is an annual meeting of the parties to the Convention.

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