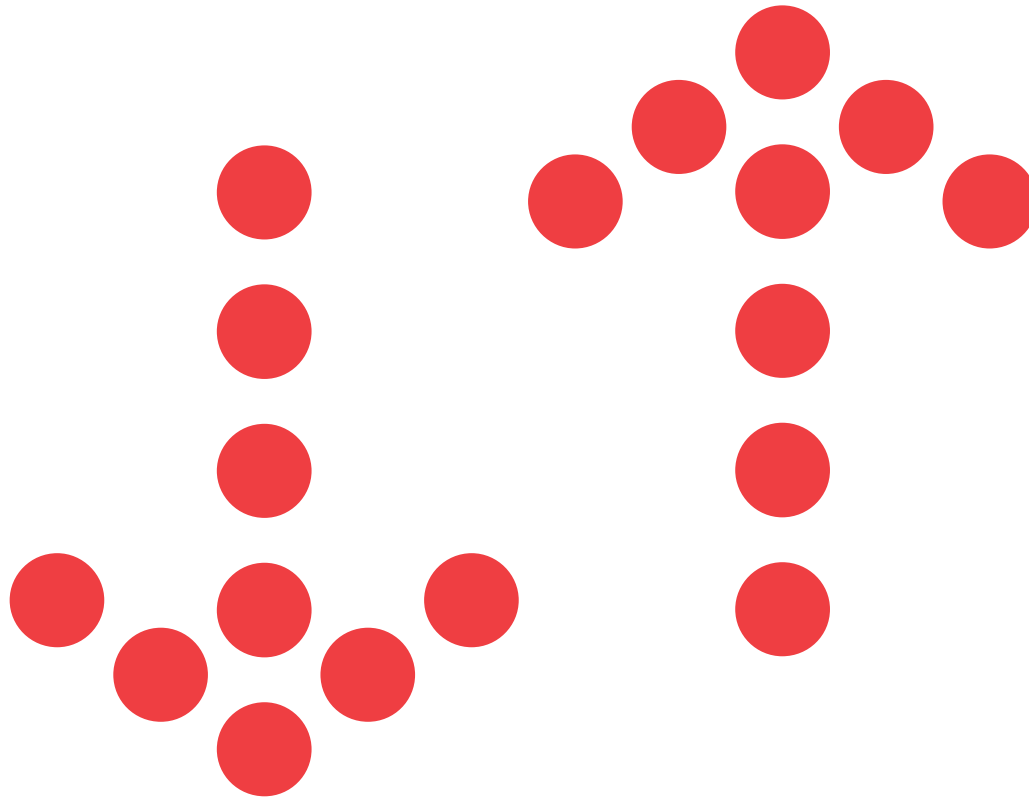


CARBON DOWN, PROFITS UP



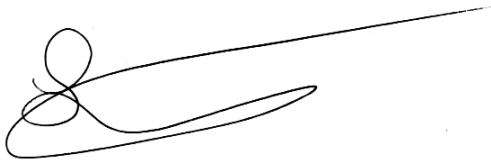
INTRODUCTION

The report you have just begun to read is intended to provide evidence that will allow the biggest actors on the global stage – corporations, governments, the media, financial institutions and others – to begin to talk about climate change action in a brand new light. In the charts on the following pages, you will see accumulated evidence that demonstrates that reducing greenhouse gas emissions can be extremely profitable and competitively advantageous.

This is important evidence to consider and to continue to refine and accumulate particularly as the Kyoto treaty comes into force following Russia's recent ratification and as the EU Emissions Trading System gets launched. These are the first official global steps easing the way toward a carbon-constrained future, and only the beginning of great efforts that will be needed to come to grips with our fossil fuel posture in the coming century.

From our vantage at The Climate Group, we have seen important evidence about successful emissions reduction scattered here and there in the most surprising places all over the globe. We are working to bring all of it together so that it forms a body of evidence, because it seems to be telling us a story that contradicts the prevailing beliefs about the expected cost of greenhouse gas reduction, and instead offers much fodder for solutions-oriented discussion and action.

The actions and experiences of the leading reducers summarized in the charts of this report are telling us that it is time to reframe the discussion. A lot of new facts, previously unrecognized, are knocking at the door. Please have a close look at these and join in our effort to find more that point the way to solutions.



STEVE HOWARD
CEO
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AN OVERVIEW OF THIS REPORT

The charts presented in the pages that follow show clearly that decisive and early action to reduce greenhouse gas emissions can be extremely profitable. Financial analysis and plant-level studies from the direct experiences of a wide range of corporations, cities, states and countries are showing us that cutting emissions is economically beneficial.

The information we've managed to collect so far is by no means exhaustive. Still, it offers a wide-ranging review of the variety of measures being undertaken to reduce greenhouse gas emissions. Many have achieved massive reductions – up to 70% over 1990 levels – and phenomenal savings – up to \$2 billion. At the same time, local and regional authorities have stepped in with a mixture of regulations and incentives to promote clean energy, energy efficiency and GHG reductions where national policy has been absent or insufficient. In many cases, these measures have gone far beyond international targets and led to millions of dollars of savings for municipal budgets, and households as well as businesses.

There is no single magic bullet for these successes. The most common gains appear to come from energy efficiency measures – building and process design, waste-reduction and incentives for using alternative sources energy sources. All the cases show the importance of taking an integrated approach that involves all the parts of an organisation.

Our chart of corporations includes twenty-two companies -from Australia, Canada, Europe, Japan, the US and the UK. Of these 5 have achieved reductions of 60% or more (DuPont, Alcan, British Telecom (BT), IBM, and Norske Canada), with combined savings of over US \$5.5 billion. Their action has also left them well-placed to respond to both local and national policies.

Our chart of cities includes thirteen municipalities. The savings achieved total over US \$1.5 billion despite the fact that many are not large urban areas. Reduction targets have included absolute CO₂; emission and carbon intensity cuts of up to 80%; cuts in energy consumption of 50% ; and renewable share of energy use of up to 25%. Other policies include building retrofits, promotion of CHP, investment in efficient transport and the use of methane captured from landfills for electricity generation.

Our chart of efforts at the state and regional level includes ten examples from the US, Canada, Europe, and Australia. These have involved setting strong regional GHG reduction targets, developing carbon management systems and registries and designing emissions trading systems. These measures have been accompanied by a range of education programmes, the use of taxes, subsidies and tariff structures to promote renewable energy and efficiency, and legislation to cap transport emissions.

Finally, our chart of countries includes six who stand at the forefront – Denmark, France, Germany, Luxembourg, Sweden and the UK. The UK has reduced its emissions 15% on 1990 levels – exceeding the requirements of the Kyoto Protocol – and the country's Action Energy Program stimulated savings of £650 million a year between 1989 and 2001. Likewise Germany's promotion of renewable energy and improved efficiency has led to the creation of more than 450,000 new jobs, undermining the oft-repeated claims that a strong climate policy is bad for business.

Though the organisations profiled face differing levels of complexity, it is evident that setting targets and establishing clear strategies brings net benefits. We hope that by disseminating these examples, others will be encouraged to follow. The Climate Group will also update the charts on a regular basis and we are keen to hear of other leadership success stories that can be added to this growing body of evidence.



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EMISSION REDUCTIONS LEADING CORPORATIONS

EMISSION REDUCTIONS LEADING CORPORATIONS

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| COMPANY | MEASURES | TARGET / REDUCTION | COST SAVINGS |
|------------------------------------|---|---|---|
| 3M | <ul style="list-style-type: none"> > Energy Efficiency > Process & Product Improvements | <ul style="list-style-type: none"> > 50% reduction in worldwide greenhouse gas emissions between 1990 & 2005¹ > 35% reduction from 1995 levels² | > US\$200 million since 1973 ³ |
| Alcan | <ul style="list-style-type: none"> > Energy Efficiency (smelter improvements) | <ul style="list-style-type: none"> > Goal of reducing greenhouse gas emissions by 500,000 tonnes over the 2001-2004 period > Objective for 2005 is estimated at 125,000 tonnes⁴ > Alcan UK achieved 65% reduction in greenhouse gas emissions between 1990 & 2000⁵ > Globally Alcan reduced total greenhouse gas emissions by 2.9 million tonnes over 2001 & 2002⁵ | – Cost savings not available |
| Alcoa | <ul style="list-style-type: none"> > Energy Efficiency > Reduced Waste | <ul style="list-style-type: none"> > Goal to reduce greenhouse gas emissions by 25% between 1990 & 2010 > Assuming success with the inert anode technology, a 50% reduction by 2010⁷ > 25% reduction in greenhouse gas emissions between 1990 & 2003⁸ | > US\$100 million annual environmental & energy cost savings by 2006 ⁹ |
| Austin Energy (city owned utility) | <ul style="list-style-type: none"> > Energy Efficiency (DSM for customers) > Renewable Energy (sales) | <ul style="list-style-type: none"> > Austin Energy committed to generating 20% of the electricity it sells from renewable sources of energy & increasing energy efficiency by 15% by 2020¹⁰ > Saved 500 MW since 1982 – removed the need for an entire coal fired power plant¹¹ | – Cost savings not available |
| BP | <ul style="list-style-type: none"> > Methane Capture > Energy Efficiency | <ul style="list-style-type: none"> > 10% reduction on 1990 greenhouse gas emission levels from 1998-2010 > Revised in 2001 – hold net emissions flat at 10% below 1990 levels until 2012 > 18% reduction in greenhouse gas emissions between 1998 & 2001¹² | > US\$650 million (1998-2001) ¹³ |
| British Telecom | <ul style="list-style-type: none"> > Reduced Fleet Size > Energy Efficiency | <ul style="list-style-type: none"> > 62% reduction in CO₂ emissions between 1991 & 2004 because of improved energy efficiency > 38% reduction in CO₂ emissions between 1992 & 2004 because of improvements to transport¹⁴ | > £600 million ¹⁵ between 1991 & 2000 |
| Canadian Forest Products Industry | <ul style="list-style-type: none"> > Energy Efficiency > Biomass Fuels | > Canadian forest industry reports reducing greenhouse gas emissions 28% below 1990 levels industry-wide ¹⁶ | > Industry reports greater competitiveness (cost savings not reported) |
| Deutsche Telekom | <ul style="list-style-type: none"> > Energy Efficiency | > Reduced CO ₂ emissions by 52% between 1995 & 2002 ¹⁷ | > €10 million ¹⁸ |
| DuPont | <ul style="list-style-type: none"> > Reduced N₂O emissions from nylon production (80%) > Energy Efficiency (20%) > Use of Renewables (<1%); 10% goal for 2010 | <ul style="list-style-type: none"> > 65% greenhouse gas reduction on 1990 levels by 2010¹⁹ > 69% reduction in greenhouse gas emissions from 1990 levels²⁰ | <ul style="list-style-type: none"> > US\$2 billion (efficiency)²¹ > US\$10-15 million (renewables)²² |
| Enbridge Gas Distribution | <ul style="list-style-type: none"> > Customer Energy Efficiency (DSM) | <ul style="list-style-type: none"> > Reducing greenhouse gas emissions resulting from company operations by 25% compared to 1990 levels²³ > Avoided 2.5 million tonnes of CO₂ between 1995 & 2003²⁴ | > CA\$700 million (customers) ²⁵ |
| IBM | <ul style="list-style-type: none"> > Energy Efficiency > Reduced perfluorocarbon (PFC) emissions from semi-conductor manufacture | <ul style="list-style-type: none"> > 4% energy efficiency goal per year > Absolute 10 % reduction in PFC emissions between 2000 & 2005 > 65% reduction in CO₂ emissions from 1990 levels > Over last five years firm has achieved annual average efficiencies of 6%²⁶ | > US\$791 million (1990-2002) ²⁷ |
| Intel | <ul style="list-style-type: none"> > Use of New Technologies > Energy Efficiency | <ul style="list-style-type: none"> > 10% absolute reduction in perfluorocarbon (PFC) emissions from 1995 levels by 2010 > Reduce worldwide energy use 4% per year through 2010 on a production-normalized basis²⁸ > 35% reduction in PFC emissions between 2001 & 2003²⁹ > 32% reduction in N₂O emissions from Intel's New Mexico site³⁰ | <ul style="list-style-type: none"> > Annual savings of US\$10 million through energy conservation projects³¹ > Cost savings for PFC reductions not available |
| Kodak | <ul style="list-style-type: none"> > Energy Efficiency | <ul style="list-style-type: none"> > 10% additional reduction committed for 2002-2007 > 17% reduction in CO₂ emissions between 1997 & 2003³² | > Senior energy manager reports this has been economically beneficial to firm; numbers not reported |
| Lafarge | <ul style="list-style-type: none"> > Energy Efficiency (40%) > Use of Cementitious Materials (56%) > Use of Biomass Fuels (4%) | <ul style="list-style-type: none"> > 20% reduction in CO₂ (per unit of production) by 2010 > Absolute reduction of 10% in the Kyoto Protocol's Annex 1 Countries > 11.8% reduction in CO₂ emissions (per unit of production) on 1990 levels³³ | > Environment manager reports this has led to savings making Lafarge more competitive in cement sector; other cement firms now following suit ³⁴ |

EMISSION REDUCTIONS LEADING CORPORATIONS CONTINUED

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| COMPANY | MEASURES | TARGET / REDUCTION | COST SAVINGS |
|---------------------------------|---|---|---|
| Norske Canada | <ul style="list-style-type: none"> > Energy Efficiency (25%) > Fuel Switching (from bunker oil to natural gas) (35%) > Use of Biomass Fuels | <ul style="list-style-type: none"> > Reduce greenhouse gas emissions by 59% between 2001 & 2005 through reduced steam usage³⁵ > 59% reduction in greenhouse gas emissions from 1990 levels³⁶ | > CA\$5 million per year ³⁷ |
| Shell | <ul style="list-style-type: none"> > Energy efficiency > Investments to end continuous gas flaring | <ul style="list-style-type: none"> > 5% reduction by 2010 on 1990 levels > 9% reduction in greenhouse gas emissions from 1990 levels³⁸ | – Cost savings not available |
| STMicroelectronics | <ul style="list-style-type: none"> > Energy efficiency > Switch to fuel cells & co-generation (65% of energy) > Renewables (5%) | <ul style="list-style-type: none"> > Goal is zero net emissions by 2010 > 20% reduction in CO₂ emissions between 1994 & 1998³⁹ | > US\$900 million during 1994-2010 ⁴⁰ |
| Swiss Re | <ul style="list-style-type: none"> > Energy Efficiency | <ul style="list-style-type: none"> > Reduce operational greenhouse gas emissions by 15% against 2002 levels by 2013 > Goal of zero net emissions by 2010 > 10% reduction in greenhouse gas emissions between 1999 & 2001⁴¹ | – Cost savings not available |
| Tembec | <ul style="list-style-type: none"> > Energy Efficiency > Biomass Fuels | <ul style="list-style-type: none"> > Committed to halving remaining emissions by 2008 > Eliminating all fossil fuel use in its plants by 2010 > 30% reduction in greenhouse gas emissions from 1990⁴² | > Senior energy manager reports this has been economically beneficial to firm; numbers not reported |
| Toyota | <ul style="list-style-type: none"> > Energy Efficiency > Thermal Emissions Recovery > Purchasing Wind Power | <ul style="list-style-type: none"> > Goal for 2003 was to reduce CO₂ emissions to 1.61 million tonnes or less > 19% reduction in CO₂ emissions from 1990 levels⁴³ | – Cost savings not available |
| United Technologies Corporation | <ul style="list-style-type: none"> > Energy Efficiency | <ul style="list-style-type: none"> > Goal of reduction in greenhouse gas emissions by 40% by 2006 > 37% reduction in greenhouse gas emissions from 1997 levels⁴⁴ | – Cost savings not available |
| Westpac | <ul style="list-style-type: none"> > Energy Efficiency > Reduced Paper Consumption | <ul style="list-style-type: none"> > Annual 5% reductions in greenhouse gas emissions⁴⁵ > 26% reduction in CO₂ emissions between 1996 & 2002⁴⁶ | – Cost savings not available |

ENDNOTES

¹ 3M website – Reducing Greenhouse Gas Emissions – http://solutions.3m.com/wps/portal/_l/en_US/_s.155/115245/_s.155/115898

² 3M response to Carbon Disclosure Project – <http://www.cdproject.net>

³ Cool Companies website – <http://www.cool-companies.org/ads/ad5.cfm>

⁴ Targeting Climate Change – [http://www.alcan.com/web/publishing.nsf/AttachmentsByTitle/Sustainability-Docs/\\$File/target_eng.pdf](http://www.alcan.com/web/publishing.nsf/AttachmentsByTitle/Sustainability-Docs/$File/target_eng.pdf)

⁵ The EU Emissions Trading Scheme & its impacts on Alcan Smelting & Power UK, Presentation to CEPS Task Force, Brussels, 5 February, 2004 – <http://ceps01.link.be/Default.php>

⁶ Alcan Beats Global Goal on Greenhouse Gas Reduction – <http://www.alcan.com/web/publishing.nsf/Content/Alcan+Beats+its+Global+Goals+on+Greenhouse+Gas+Reduction>

⁷ Alcoa Global EHS Goals website – <http://www.alcoa.com/global/en/environment/goals.asp>

⁸ Alcoa response to Carbon Disclosure Project – <http://www.cdproject.net>

⁹ Ibid.

¹⁰ Five power companies commit to clean energy & limits on CO₂ – http://www.enn.com/news/2004-02-24/s_13263.asp

¹¹ Presentation by Roger Duncan, Vice President, Austin Energy – The Business Case for Renewable Energy, WWF & WRI Side Event, Renewables 2004, June 1, 2004, Bonn.

¹² Chris Mottershead, Distinguished Advisor, Energy & the Environment, BP, Personal communication [e-mail] with Jim Walker, The Climate Group, September 29, 2003.

¹³ Defining our Path, BP Sustainability Report 2003, p. 23

¹⁴ Action on Climate Change –

<http://www.btplc.com/Societyandenvironment/Socialandenvironmentreport/Environment/Emissionstoair/Actiononclimatechange.htm>

¹⁵ Ibid.

¹⁶ Presentation by Lyn Brown, Director, Corporate Affairs & Social Responsibility, Norske Canada – Conference of the Reducers, May 12, 2004, Toronto. Also http://www.joanneum.ac.at/iea-bioenergy-task38/projects/task38casesstudies/can_brochure.pdf

¹⁷ Deutsche Telekom 2003 Human Resources & Sustainability Report – http://download-dtag.t-online.de/englisch/company/9-sustainability/040402_humanresources_sustainability_report_2003.pdf

¹⁸ Ibid.

¹⁹ DuPont Progress Report, Data Summary –

http://www1.dupont.com/NASApp/dupontglobal/corp/index.jsp?page=/content/US/en_US/social/SHE/usa/us3b.html

²⁰ Ibid.

²¹ Progress Report, Message from Chief Executive –

http://www1.dupont.com/NASApp/dupontglobal/corp/index.jsp?page=/content/US/en_US/social/SHE/usa/us1.html

²² Paul Tebo, Vice President for Health, Safety & Environment, DuPont, interview with Shelagh Whitley, The Climate Group, March 10, 2004

²³ Enbridge Climate Change Action Plan – http://www.cgc.enbridge.com/G/G05-03-01_climate-change.asp

²⁴ Presentation by Arunas Plekaitis, Vice President, Enbridge Gas Distribution – Conference of the Reducers, May 10, 2004, Toronto.

²⁵ Ibid.

²⁶ Presentation by Ravi Kutchibhotla, Corporate Program Manager for Energy Management, IBM – Conference of the Reducers, May 12, 2004, Toronto.

²⁷ Ibid.

²⁸ Intel Corporate Performance – Goals & Targets – http://www.intel.com/intel/finance/gcr03/11-goals_targets.htm

²⁹ Intel Global Citizen Report 2003, Download of Report Data – <http://www.intel.com/intel/finance/gcr03/>

³⁰ Pew Center on Global Climate Change website – http://www.pewclimate.org/what_s_being_done/in_the_business_community/processimprovements.cfm

³¹ Tim Higgs, Senior Environmental Engineer, Worldwide EH&S, Intel, interview with Shelagh Whitley, The Climate Group, August, 2004.

³² Kodak 2003 Corporate HSE Report, p. 9

³³ Lafarge Sustainability Report 2003, p. 2

³⁴ Chris Boyd, Senior VP Environment, Lafarge, interview with Sophy Bristow, The Climate Group, February 26, 2004

³⁵ Submission to the Climate Change Voluntary Challenge & Registry – <http://www.vcr-mvr.ca/registry/out/C0049-NORSKESKOG01-PDF.PDF>

³⁶ Norske Canada Accountability Report 2003, p.15

³⁷ Presentation by Lyn Brown, Director, Corporate Affairs & Social Responsibility, Norske Canada – Conference of the Reducers, May 12, 2004, Toronto.

³⁸ Shell Website – Environmental Performance –

http://www.shell.com/home/Framework?siteId=royal-en&FC2=royal-en/html/iwgen/our_performance/environmental/zzz_lhn.html&FC3=royal-en/html/iwgen/our_performance/environmental/2003_env_emissions.html

³⁹ Lotspeich, C. Ecology is Free: RMI's work with STMicroelectronics – <http://www.rmi.org/sitepages/pid1059.php>

⁴⁰ Ibid.

⁴¹ Swiss Re Sustainability Report 2003, p. 3

⁴² Jacques Rocray, Vice President, Environment & Technology, Tembec, conversation with Michael Northrop, May, 2004.

⁴³ Toyota Environmental & Social Report 2003, p. 29

⁴⁴ Ellen Quinn, Director of Environmental Programs, UTC, conversation with Michael Northrop, May, 2004.

⁴⁵ Westpac response to Carbon Disclosure Project – <http://www.cdproject.net>

⁴⁶ Australian Greenhouse Challenge website – http://www.greenhouse.gov.au/cgi-bin/challenge/dbsearch.pl?page=report_detail;aid=355;report_id=860

EMISSION REDUCTIONS LEADING CITIES

EMISSION REDUCTIONS LEADING CITIES¹

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| CITY | MEASURES | TARGET / REDUCTION | COST SAVINGS |
|--|--|---|---|
| Berlin, Germany | <ul style="list-style-type: none"> > Information & advisory programs on energy efficiency > Use of combined heat & power (CHP) generation & minimizing the losses in gas & heat distribution systems > Use of energy contracting > Increased use of solar energy | <ul style="list-style-type: none"> > 15% reduction in CO₂ emissions between 1990 levels & 2000 > 17% reduction in CO₂ emissions between 1990 & 1997² | <ul style="list-style-type: none"> > Municipal budget relief of £2 million per year³ |
| Hannover, Germany | <ul style="list-style-type: none"> > Construction of low energy houses > PV installation on public buildings > Use of combined heat & power (CHP) > 'GSE' (energy saving in schools) > 'Tatort Büro' (energy saving in municipal buildings) > 'KliK' (climate protection in kindergartens) | <ul style="list-style-type: none"> > 25% reduction in CO₂ emissions on 1990 levels by 2005 (set in 1992) > 6% reduction of CO₂ emissions across the city between 1990 & 1997, with heating systems achieving a 19% reduction in emissions > Hannover is currently planning a final audit covering 1990 – 2005⁴ | <ul style="list-style-type: none"> > Projects including KliK, Tatort Büro, & GSE have saved over € 400,000⁵ |
| Heidelberg, Germany | <ul style="list-style-type: none"> > Retrofit of public buildings > Purchase of renewable energy (solar & biogas CHP) > KLiBA (non-profit energy consulting company) founded in conjunction with local municipalities & the local savings bank – provides free energy efficiency advice | <ul style="list-style-type: none"> > 20% reduction in CO₂ emission on 1987 levels by 2005 > 30% reduction in CO₂ emissions from municipal buildings⁶ | <ul style="list-style-type: none"> > US\$1.5 million annually on municipal fuel bill⁷ |
| Leicester, England | <ul style="list-style-type: none"> > Use of CHP in community heating | <ul style="list-style-type: none"> > 50% reduction in energy consumption on 1990 levels by 2025 > Supply 20% of the city's energy needs from renewable sources by 2020⁸ > Reduced emissions by 47,500 tonnes of CO₂ between 1993 & 2001⁹ | <ul style="list-style-type: none"> > Saved £3.9 million in energy costs since 1993¹⁰ |
| Melbourne, Australia | <ul style="list-style-type: none"> > Energy audits & retrofits for buildings > Purchase & production of renewable energy | <ul style="list-style-type: none"> > 30% reduction of municipal emissions on 1996 levels by 2010 > 20% reduction of community emissions on 1996 levels by 2010¹¹ > By 2003 had reduced municipal greenhouse gas emissions by 10.5% on 1996 levels > Reduced community wide emissions by 1% on 1996 levels¹² | <ul style="list-style-type: none"> – Cost savings not available |
| Portland, Oregon, United States | <ul style="list-style-type: none"> > Public-private energy conservation partnerships > Education on rebates, tax credits & other incentives offered by State of Oregon > Green building standards > Requirement that 50% of solid waste from businesses be recycled > Commitment to public transportation & cycling within the city > Renewable demonstration projects > Use of LED traffic lights | <ul style="list-style-type: none"> > 20% reduction in CO₂ emission on 1988 levels by 2010¹³ > 7% CO₂ reduction in emissions from council-owned vehicles & facilities compared to 1990 levels¹⁴ | <ul style="list-style-type: none"> > US\$300 million in savings for households and businesses since 1990¹⁵ |
| Port Phillip, Australia | <ul style="list-style-type: none"> > Lighting retrofits > Solar panel installation | <ul style="list-style-type: none"> > 20% reduction of greenhouse gas emissions on 1996 levels by 2011¹⁶ > 11% reduction of greenhouse gas emissions from council-owned vehicles and facilities & saving of 28,000 tonnes of CO₂ from community & council sources¹⁷ | <ul style="list-style-type: none"> > Total cost saving over AU\$120,000¹⁸ |
| Regina, Canada | <ul style="list-style-type: none"> > Connecting street lighting to high pressure sodium vapour > Converting vehicle fleet from gasoline to compressed natural gas > Improving efficiency of water supply system & sewage treatment > Improving building lighting, heating & ventilation | <ul style="list-style-type: none"> > 20% reduction of greenhouse gas emissions on 1988 levels by 2005 > Additional 1% reduction each year until 2012 > Includes emissions from municipal operations & all activities within geographical jurisdiction of the city¹⁹ > 9% reduction of greenhouse gas emissions from council-owned vehicles & facilities on 1988 levels (equivalent to 10,000 tonnes annually)²⁰ | <ul style="list-style-type: none"> > CA\$500,000 saved per year on energy costs > Expenditures up to 1997 matched cumulative savings from energy retrofits²¹ |
| Minneapolis-St. Paul, Minnesota, United States | <ul style="list-style-type: none"> > Energy retrofits in municipal buildings > Recycling & waste reduction > Equipment & lighting conversion > District heating/cooling & transport improvements | <ul style="list-style-type: none"> > 20% reduction in CO₂ emissions by 2005 on 1988 levels (set in 1992) > 12% reduction in CO₂ emissions between 1988 & 1998²² | <ul style="list-style-type: none"> > Municipal building retrofits saving US\$113 million annually in energy costs²³ |
| San Diego, California, United States | <ul style="list-style-type: none"> > Using landfill gas to generate power > Award-winning composting program & diversion of waste through recycling and greenwaste collection > Methane gas from landfill converted to liquefied natural gas (LNG) to fuel over 100 refuse collection trucks > Photovoltaics on city facilities | <ul style="list-style-type: none"> > 15% reduction in greenhouse gas emissions from 1990 levels by 2010 > Source 50 MW of energy by 2013 using PV generation > 15% annual reduction in fuel consumption by city vehicles > Efficiency improvements to city operations over period 1994-2001 reduced energy use by 144 million kWh, & CO₂ emissions by 89 thousand tonnes²⁴ | <ul style="list-style-type: none"> > Cumulative energy cost savings of US\$15 million from city utility bills²⁵ |

EMISSION REDUCTIONS LEADING CITIES CONTINUED

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| CITY | MEASURES | TARGET / REDUCTION | COST SAVINGS |
|-------------------|--|---|---|
| → Toronto, Canada | <ul style="list-style-type: none"> > Methane capture from landfills > Building retrofits > Efficient street lighting > Improved public transportation | <ul style="list-style-type: none"> > 20% greenhouse gas emission reductions by 2005 on 1990 levels > 42% reduction in greenhouse gas emissions in municipal facilities between 1990 & 1998 (majority of reductions achieved through methane capture)²⁶ | <ul style="list-style-type: none"> > CA\$20-30 million in cumulative revenue estimated from landfill methane capture²⁷ > CA\$17.5 million saved in energy and maintenance costs through investments of Toronto Atmospheric Fund²⁸ |
| Växjö, Sweden | <ul style="list-style-type: none"> > Conversion of electric heating to biomass district heating > Use of combined heat & power (CHP) fuelled with biomass > Improvement in energy efficiency in companies > Free energy advice | <ul style="list-style-type: none"> > 50% reduction in CO₂ emissions from fossil fuels per capital by 2010 on 1993 levels (set in 1996) > Reduce the use of electricity per capita by 20 % from 1993 to 2010²⁹ > Stop using fossil fuels in city's activities³⁰ > 18% reduction in emissions between 1993 & 2002³¹ | <ul style="list-style-type: none"> – Cost savings not available |
| Woking, England | <ul style="list-style-type: none"> > Efficient lighting > Construction of efficient facilities & buildings > Use of CHP (combined heat & power), fuel cell, & solar power > Promoting the use of low carbon vehicles > Introduction of a carbon offset charge for the use of car parks (from April 2004) | <ul style="list-style-type: none"> > 40% reduction in energy consumption from municipal buildings by 2001 on 1991 levels (set in 1990) > 80% reduction of Woking's greenhouse gas emissions (municipality & community) by 2090 on 1990 levels (set in 2002) > In 2002 had reduced energy consumption 43.8% on 1990 levels, & reduced CO₂ emissions 71.5% (96,588 tonnes) from council-owned vehicles & facilities³² | <ul style="list-style-type: none"> > £4.9 million saved in municipal energy & water bills since 1990³³ |

ENDNOTES

¹ ICLEI – Cities for Climate Protection (CCP) program has developed a world-wide movement of local governments who adopt policies & implement measures to reduce local greenhouse gas (ghg) emissions. The following is a list of the ICLEI CCP membership worldwide:

| CONTINENT | Municipalities in ICLEI CCP |
|---------------|-----------------------------|
| Africa | 8 |
| Asia-Pacific | 228 |
| Europe | 118 |
| Latin America | 18 |
| Middle East | 0 |
| United States | 147 |
| Canada | 101 |
| North America | 249 |
| Worldwide | 621 |

² Berlin spart Energie – http://www.stadtentwicklung.berlin.de/umwelt/klimaschutz/berlin_spart_energie/index_en2.shtml

³ Ibid.

⁴ Environmental Protection Division, City of Hannover, 10 years of Climate Protection in Hannover, 2002, <http://www.hannover.de/deutsch/doku/10/klimaenglisch.pdf>

⁵ Ibid.

⁶ Climate Change, Heidelberg Germany, 2001. <http://www.energie-cites.org/BD/PDF/hei-cha-en.pdf>

⁷ Michael Northrop, Governments & Industries Light Way to Climate Change Solutions, CGBD – Biodiversity, Vol. 13, No. 3 Summer 2003, <http://www.ccbd.org/visitor/publications/summer2003.pdf>

⁸ DEFRA – Climate Change: The UK Programme p. 66 – <http://www.defra.gov.uk/environment/climatechange/cm4913/pdf/section2.pdf>

⁹ Action on Climate Change – <http://www.btplc.com/Societyandenvironment/Socialandenvironmentreport/Environment/Emissionstoair/Actiononclimatechange.htm>

¹⁰ BBC website for Leicester – http://www.bbc.co.uk/leicester/features/environment/2002_05/globeshare/climate_change_renewable_energy_and_energy_efficiency.shtml

¹¹ City of Melbourne, Melbourne's Greenhouse Action Plan 2001– 2003, Page 3, <http://www.melbourne.vic.gov.au/greenhouse/content.cfm?infopageid=1>

¹² Ibid.

¹³ Susan Anderson, EPA State and Local Climate Change Partners Conference, November 2002. [http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/AD1M5H4PTD/\\$File/11_Susan_Anderson.pdf](http://yosemite.epa.gov/oar/globalwarming.nsf/UniqueKeyLookup/AD1M5H4PTD/$File/11_Susan_Anderson.pdf)

¹⁴ The City of Portland, Oregon's Carbon Dioxide Reduction Strategy, ICLEI Website, www.iclei.org/aplans/portlap.htm

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¹⁶ City of Port Phillip, Port Phillip's commitment to climate protection, 2004, <http://www.portphillip.vic.gov.au/ccp.html>

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²⁴ Linda Giannelli Pratt, Manager, San Diego Sustainable Community Program, interview with Nancy Skinner, March 2004.

²⁵ Ibid.

²⁶ Phil Jessup, Toronto Atmospheric Fund, interview with Shelagh Whitley, March 2004.

²⁷ RIS International & Torrie Smith Associates, Moving Towards Kyoto: Toronto – Emission Reductions 1990-1998, Policy Report for Toronto Atmospheric Fund, April 22, 2003, www.city.toronto.on.ca/taf/pdf/moving_towards_kyoto_policyreport.pdf

²⁸ City of Toronto Webpage, Toronto Atmospheric Fund, <http://www.city.toronto.on.ca/taf/>

²⁹ City of Växjö – Sustainable Development – <http://www.vaxjo.se/english/sustainable.html>

³⁰ City of Växjö – http://www.vaxjo.se/english/fossil_fuel_free.html

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EMISSION REDUCTIONS LEADING STATES/REGIONS

EMISSION REDUCTIONS LEADING STATES/REGIONS¹

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| STATE/REGION | MEASURES | TARGET |
|------------------------------|--|--|
| Bavaria, Germany | <ul style="list-style-type: none"> > R&D into renewable energies (€ 300 million invested in past 5 years) > Supporting a high alpine climate research centre² | <ul style="list-style-type: none"> > Reduce CO₂ emissions by 10% on 1999 levels by 2010³ |
| California, United States | <ul style="list-style-type: none"> > Law to regulate greenhouse gas emissions from cars starting with the 2009 model-year⁴ > Public goods charge on electricity that provides funding for renewable power generation & energy efficiency⁵ > Rebates for customer owned solar & wind systems > Greenhouse gas emissions registry for private & public sector organisations > Energy efficient building code policies⁶ | <ul style="list-style-type: none"> > 20% of retail electricity to be generated from renewable sources by 2017⁷ > Reduce electricity consumption in businesses & households by 20% (rewarded by 20% payment)⁸ > Governor Schwarzenegger has requested a state-wide emissions reduction target |
| Connecticut, United States | <ul style="list-style-type: none"> > Connecticut Innovations Clean Energy Fund to promote the production & use of clean energy > Legislation requiring updated energy efficiency standards for eight different products > Legislation requiring the state to adopt California's stringent emission standards for light duty motor vehicles⁹ | <ul style="list-style-type: none"> > Short term – reduce greenhouse gas emissions to 1990 levels by the year 2010 > Medium term – reduce greenhouse gas emissions 10% below 1990 levels by the year 2020 > Long term – reduce greenhouse gas emissions sufficiently to eliminate any dangerous threat to the climate; current science suggests this will require reductions as much as 75-85% below current levels > Executive order requiring the state to purchase 20% of energy used for state buildings from nonpolluting sources by 2010. The percentage rises to 50% by 2020 & 100% by 2050¹⁰ |
| Massachusetts, United States | <ul style="list-style-type: none"> > Regulations requiring power plants to reduce emissions of CO₂ through increased efficiency or the purchase of CO₂ credits > Mass Renewable Energy Trust was established through a charge on electricity bills to fund renewables research, development & demonstration > Requiring transportation projects to report on expected CO₂ emissions > 'Greening' state vehicle fleet¹¹ | <ul style="list-style-type: none"> > Short term – reduce greenhouse gas emissions to 1990 levels by the year 2010 > Medium term – reduce greenhouse gas emissions 10% below 1990 levels by the year 2020 > Long term – reduce greenhouse gas emissions sufficiently to eliminate any dangerous threat to the climate; current science suggests this will require reductions as much as 75-85% below current levels > Massachusetts Renewable Portfolio Standard requires generators to provide 1% of their electricity from renewables by 2003, rising to 4% by 2009¹² |
| Manitoba, Canada | <ul style="list-style-type: none"> > Legislation to promote the use of ethanol in cars & research into use of bio-diesel > Demonstration of fuel cells & hydrogen generation > Efficiency Manitoba established in 2003 to integrate Demand Side Management (DSM) programs¹³ | <ul style="list-style-type: none"> > 23% reduction in greenhouse gas emissions on 1990 levels by 2012 > Increased production of hydro & wind power for sale to the province of Ontario¹⁴ |
| New Jersey, United States | <ul style="list-style-type: none"> > Mandated reporting of both CO₂ & methane from large sources > Organisations (including the state's largest utility, schools, colleges, universities, and more than 6,000 congregations) have signed a pledge to reduce their greenhouse gas emissions in accordance with the state goal > Social benefit charge on utility bills for energy efficiency & renewable energy > Environmental disclosure requirements for utilities to provide customers with information about CO₂ emissions of the electricity they are using > Development of a multi-tier system for permitting that incorporates greenhouse gases > Entering into formal agreements with the Netherlands & Canada allowing for the development of joint trading projects & environmental technology reciprocity¹⁵ | <ul style="list-style-type: none"> > 3.5% reduction in New Jersey's greenhouse gas emissions below 1990 levels by 2005 > Renewable Portfolio Standard that gradually increases toward a mandatory level of 4% of overall state supply by 2012¹⁶ |
| New York, United States | <ul style="list-style-type: none"> > Governor Pataki invited the governors of the other northeast states to participate in the development of a regional cap-and-trade program (RGGI) to be launched in April of 2005¹⁷ > Clean-Fueled Bus Program provides funding for the incremental cost of a clean-fueled bus over a diesel bus > System benefits charge to fund energy efficiency, R&D in renewable resources, and combined heat & power (CHP)¹⁸ | <ul style="list-style-type: none"> > Reduce primary energy use per unit of Gross State Product 25% below the 1990 level of energy use by 2010 > Increase renewable energy from 10% of primary energy use currently to 15% by 2020 > Reduce greenhouse gas emissions 5% below 1990 levels by 2010 > Establish a private sector bio-fuels industry in the state within five to ten years¹⁹ |
| New South Wales, Australia | <ul style="list-style-type: none"> > NSW Greenhouse Gas Abatement Scheme, an initiative to reduce greenhouse gas emissions per capita in NSW to 7.27 tonnes by 2007 & maintain this level until 2012. Each year a target will be set by NSW electricity retailers, which they must meet or pay penalties²⁰ | <ul style="list-style-type: none"> > Reduce greenhouse gas emissions by 5% per cent below 1989/90 levels by 2010²¹ |



EMISSION REDUCTIONS STATES/REGIONS CONTINUED

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| COMPANY | MEASURES | TARGET |
|---------------------|--|--|
| → Tuscany, Italy | > Draft proposal for the inclusion of regional governments in the EU emissions trading scheme (EU ETS) ²² | > Reduce greenhouse gases according to the Kyoto Protocol, 6.5% compared with 1990 levels for the 2008-2012 commitment period > Increase percentage of energy produced from renewable sources > Stabilize & reduce energy consumption ²³ |
| Victoria, Australia | > Renewable Energy Support Fund to assist in the development of small-scale renewable energy generation projects > Green Power accreditation to provide confidence to consumers > Support for research & analysis of market needs & opportunities & to promote Green Power products > Solar hot water rebates > Consideration of greenhouse gas emissions as part of the State's Environmental Impact Assessment process ²⁴ | > Reduce energy consumption in government buildings by 15% > Reduce greenhouse gas emissions from the government's vehicle fleet by 10% > Commitment from the State Government to purchase 10% of its electricity needs in the form of Green Power ²⁵ |

ENDNOTES

¹ New England Governors & Eastern Canadian Premiers: Maine, New Hampshire, Vermont, Rhode Island, Massachusetts, & Connecticut in the US, and Quebec, New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland & Labrador in Canada, have committed to the following goals.
Short-term Goal: Reduce regional greenhouse gas emissions to 1990 emissions by 2010.
Mid-term Goal: Reduce regional greenhouse gas emissions by at least 10% below 1990 emissions by 2020, & establish an iterative five-year process, commencing in 2005, to adjust the goals if necessary & set future emissions reduction goals.
Long-term Goal: Reduce regional greenhouse gas emissions sufficiently to eliminate any dangerous threat to the climate; current science suggests this will require reductions of 75–85% below current levels.

² Climate Protection: Bavarian Government's Research Priorities – [http://www.britischesbotschaft.de/en/embassy/r&t/notes/rt-note03.3053\(m\)_bavarian_climate.html](http://www.britischesbotschaft.de/en/embassy/r&t/notes/rt-note03.3053(m)_bavarian_climate.html)

³ Ibid.

⁴ Greenhouse Gas Standards for Vehicles – <http://www.pewclimate.org/states.cfm?ID=51>

⁵ Public Goods Charge & PV Funding in California – <http://www.calseia.org/CECPGC3web.html>

⁶ California State Climate Change Activities – http://www.energy.ca.gov/global_climate_change/state_roles.html

⁷ Renewable Resources Development Report – http://www.energy.ca.gov/papers/2003-11-19_PETERSON_RRDR.PPT

⁸ California Public Benefits Program – http://pnnl-utilityrestructuring.pnl.gov/publications/Presentations/California_Public_Benefits_Programs.htm

⁹ Center for Clean Air Policy May 2004 Newsletter – <http://www.ccap.org/>

¹⁰ Ibid.

¹¹ Massachusetts Climate Protection Plan – <http://www.mass.gov/ocd/docs/MAClimateProtectionPlan.pdf>

¹² Ibid.

¹³ Presentation by Tim Sale, Minister, Manitoba Energy, Science & Technology, Conference of the Reducers, Toronto, May 2004

¹⁴ Ibid.

¹⁵ New Jersey – Greenhouse Gas Reduction Target – <http://www.pewclimate.org/states.cfm?ID=42>

¹⁶ Ibid.

¹⁷ Regional Greenhouse Gas Initiative Moves Forward* – <http://www.dec.state.ny.us/website/environmentdec/2004a/rgginews1.html>

*Currently 9 states are participating including Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, Rhode Island, and Vermont. In addition, Maryland, the District of Columbia, Pennsylvania, the Eastern Canadian Provinces & New Brunswick are observers in the process.

¹⁸ System Benefits Charge (SBC) – <http://www.dps.state.ny.us/sbc.htm>

¹⁹ State Energy Office Project Brief – http://www.eere.energy.gov/state_energy_program/project_brief_detail.cfm/pb_id=259N

²⁰ NSW Greenhouse Gas Abatement Plan – http://www.originenergy.com.au/business/files/gas_scheme.pdf

²¹ Ibid.

²² A Pilot Initiative of Regional Governments to Broaden the Scope of EU Emissions Trading – <http://www.theclimategroup.org/assets/~1331039.pdf>

²³ Tuscany & the Environment – <http://www.nrg4sd.net/Download/Events/Perth/11>

²⁴ Growing Victoria Together – [http://www.dpc.vic.gov.au/CA256D800027B102/lookup/GVTBookletPDF/\\$file/DPCbrochure.FA.pdf](http://www.dpc.vic.gov.au/CA256D800027B102/lookup/GVTBookletPDF/$file/DPCbrochure.FA.pdf)

²⁵ Victorian Greenhouse Strategy – <http://www.greenhouse.vic.gov.au/strategy/summary.htm>

EMISSION REDUCTIONS LEADING COUNTRIES

EMISSION REDUCTIONS LEADING COUNTRIES

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| COUNTRY | MEASURES | TARGET / REDUCTION | COST SAVINGS |
|----------------|--|---|---|
| Denmark | <ul style="list-style-type: none"> > Instituted labelling of cars to inform consumers of vehicle efficiency & CO₂ carbon emissions > Reduced registration fees for fuel efficient vehicles > Higher energy taxes on natural gas, gasoline, diesel, diesel light, fuel oil, coal, & electricity > CO₂ emissions trading system for electricity producers | <ul style="list-style-type: none"> > The Kyoto Protocol & EU burden sharing agreement commits Denmark to reduce greenhouse gas emissions by 21% below 1990 levels by 2008 & 2012 commitment period > National target of 20% reduction in CO₂ emissions below 1988 levels by 2005¹ > 1% reduction in greenhouse gas emissions between 1990 & 2002² | <ul style="list-style-type: none"> – Cost savings not available |
| France | <ul style="list-style-type: none"> > Government/Industry agreement to reduce greenhouse gas emissions – companies not achieving reduction goals in 2004 & 2007 will pay fines > Mass media climate change campaign > Climate Plan includes around sixty measures to reduce emissions by 54 million tonnes of CO₂ equivalent a year by 2010³ | <ul style="list-style-type: none"> > Maintain greenhouse gas emissions at 1990 levels over the 2008-12 commitment period > Long-term goal to cut greenhouse gas emissions by 75% before 2050⁴ > 2% reduction in greenhouse gas emissions between 1990 & 2002⁵ | <ul style="list-style-type: none"> – Cost savings not available |
| Germany | <ul style="list-style-type: none"> > Stepwise increases in energy prices while creating incentives for the development & application of energy-efficient technologies > Levies on electricity, fuel oils, natural gas & liquid petroleum gas > Renewable Energy Source Act & Biomass Ordinance to promote electricity supply from renewable sources > Investments to improve building materials & modernise energy supply | <ul style="list-style-type: none"> > 21% reduction in greenhouse gas emissions on 1990 levels by 2010 > Long term goal of 40% reduction on 1990 levels by 2020 (on the condition that the EU as a whole commits to a 30% cut) > 19% reduction in greenhouse gas emissions between 1990 & 2002⁶ | <ul style="list-style-type: none"> > Creation of up to 450,000 jobs⁷ > € 18.6 million from eco-taxes have been used for gradual reduction & stabilization of employer & employee pension contributions⁸ > In 2003 companies in the renewable energy sector recorded a turnover of approximately € 10 billion⁹ |
| Luxembourg | <ul style="list-style-type: none"> > Grants for purchase of efficient vehicles (2001) > Introduction of tax reform for energy > Energy efficiency in energy production & in the building sector > Goal of providing 10% of national total electricity consumption by 2010 from renewables | <ul style="list-style-type: none"> > Under the EU burden sharing agreement Luxembourg is to reduce its emissions by 28% for the 2008-2012 commitment period¹⁰ > 15% reduction in greenhouse gas emissions between 1990 & 2002¹¹ | <ul style="list-style-type: none"> – Cost savings not available |
| Sweden | <ul style="list-style-type: none"> > Tax reform (from taxing labour to carbon dioxide) > Reduced use of oil-fired heating & greater use of alternative heating methods > Tax relief for environmental cars & bio-fuels > Education to increase awareness of climate change > Grants for municipalities, companies & others for measures that reduce greenhouse gas emissions (SEK 340 million for climate investments in 2004) | <ul style="list-style-type: none"> > Reduce emissions 4% by 2010 on 1990 levels > Reduce per capita emissions by 40% by 2050 (according to the Kyoto Protocol Sweden is allowed to increase emissions by 8%)¹² > Long term goal set alongside UK of 60% CO₂ reduction by 2050¹³ > 4% reduction in greenhouse gas emissions between 1990 & 2002¹⁴ | <ul style="list-style-type: none"> – Cost savings not available |
| United Kingdom | <ul style="list-style-type: none"> > Energy Efficiency Commitments for domestic energy suppliers > Climate Change Levy – tax on business use of energy (renewables & CHP are exempted) > Grants for the development & demonstration of new technologies > UK Emissions Trading Scheme with participants volunteering to make absolute annual reductions > Renewables Obligation defining the amount of electricity that must be generated from renewable sources | <ul style="list-style-type: none"> > Reduce greenhouse gas emissions by 12.5% below 1990 levels by 2008 & 2012 commitment period > Unilaterally increased target to 20% CO₂ reduction on 1990 levels by 2010 > Long term goal of 60% CO₂ reduction on 2003 levels by 2050¹⁵ > 15% reduction in greenhouse gas emissions between 1990 & 2002¹⁶ | <ul style="list-style-type: none"> > Between 1990 & 2002 the economy grew by 30%¹⁷ > The Carbon Trust identified savings of £70-135 million in 2003/4 through the reduction of 0.9-1.8 million tonnes of CO₂¹⁸ > Action Energy Program stimulated UK energy savings of around £650 million a year between 1989 & 2001¹⁹ |



ENDNOTES

¹ Denmark – Progress on Greenhouse Gas Emissions Trading – http://www.nrtee-tmee.ca/EmissionsTrading/en/overview_countries_Denmark.htm Ibid.

² Greenhouse gas emissions in EU15 declining – <http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/04/932&format=HTML&aged=0&language=en&guiLanguage=en>

³ How can we Combat Warming?
http://www.citesciences.fr/francais/ala_cite/science_actualites/sitesactu/question_actu.php?langue=en&id_article=2943&textRecherche=&noPage=0&radioSur=&dateDocu=0

⁴ Ibid.

⁵ Greenhouse gas emissions in EU15 declining – <http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/04/932&format=HTML&aged=0&language=en&guiLanguage=en>

⁶ Ibid.

⁷ Kyoto good for business, says Tritten – <http://www.germany-info.org/relaunch/info/publications/week/2004/040102/economy2.html>

⁸ The ecological tax reform: introduction, continuation & further development to an ecological financial reform
http://www.bmu.de/en/800/js/download/b_oekesteuereform_en/

⁹ Renewable Energies: The way forward – http://www.bmu.de/files/broschuere_ee_zukunft_en.pdf

¹⁰ Luxembourg – http://europa.eu.int/comm/environment/docum/0735_luxembourg.pdf

¹¹ Greenhouse gas emissions in EU15 declining – <http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/04/932&format=HTML&aged=0&language=en&guiLanguage=en>

¹² Ibid.

¹³ IEA Commends Sweden's International Market Approach to Energy – http://www.iea.org/Textbase/press/pressdetail.asp?PRESS_REL_ID=130

¹⁴ UK & Sweden – Reduce the emissions of CO₂ by 60 per cent – http://www.acidrain.org/AN2-03.htm#UK_Sweden

¹⁵ Our energy future: creating a low carbon economy – <http://www.dti.gov.uk/energy/whitepaper/index.shtml>

¹⁶ Greenhouse gas emissions in EU15 declining – <http://europa.eu.int/rapid/pressReleasesAction.do?reference=IP/04/932&format=HTML&aged=0&language=en&guiLanguage=en>

¹⁷ Joint statement by Environment Secretary Margaret Beckett & CBI Director General Digby Jones on climate change –

<http://www.defra.gov.uk/news/statements/040609.htm>

¹⁸ Carbon Trust Annual Report 2003-2004

¹⁹ DEFRA – Climate Change: The UK Programme p. 74 – <http://www.defra.gov.uk/environment/climatechange/cm4913/pdf/section2.pdf>

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