



***Enhancing Markets for Climate Friendly Technologies:
Leadership Through
Government Purchasing Strategies***

Volume I

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The member countries of the CTI include: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, The Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States of America. The European Commission also participates.

CTI Mission Statement

To promote the objectives of the UNFCCC by fostering international co-operation for accelerated development and diffusion of climate-friendly technologies and practices for all activities and greenhouse gases.

CTI Core Values

- Focus on areas where CTI can make a significant difference*
- Collaborate closely with developing and transition countries*
- Work in partnership with stakeholders, including the private sector, non-governmental organisations (NGOs), and other international organisations*
- Mobilise objective and effective expertise on a voluntary basis.*

CONTENTS

1	SCOPE OF THE STUDY	4
2	GOVERNMENTS' ROLE AS PURCHASER.....	5
2.1	Leadership.....	5
2.2	Objectives of Government Purchasing Programmes.....	5
2.3	Governments' Objectives In Enhancing the Market for Climate Friendly Technologies.....	6
3	BARRIERS.....	8
3.1	Financial Barriers.....	8
3.2	The Information Barrier.....	9
4	TARGET TECHNOLOGIES.....	11
4.1	Energy Supply in Government Facilities.....	11
4.1.1	Solar Thermal (Active Solar) Design.....	11
4.1.2	Photovoltaics (PV).....	13
4.1.3	PV for Telecommunications.....	16
4.2	Buildings : Key Issues.....	17
4.2.1	Targets.....	17
4.2.2	Building Regulations.....	18
4.2.3	Demonstration Schemes.....	19
4.3	Target Technologies in Buildings.....	20
4.3.1	Passive Solar Design.....	21
4.3.2	Windows.....	23
4.3.3	Combined Heat and Power (CHP).....	25
4.3.4	Boilers and Heating Systems.....	27
4.3.5	Air Conditioning.....	29
4.3.6	Heat Pumps.....	31
4.3.7	Electric Motors.....	34
4.3.8	Lighting.....	35
4.4	Appliances : Office Equipment.....	39
4.4.1	Copiers.....	40
4.4.2	Computers.....	42
4.5	Domestic Appliances.....	43
4.5.1	Refrigerators.....	43
4.6	Vehicles.....	45

5	TOOLS FOR ENHANCING MARKETS.....	49
5.1	Financing Technology Purchasing.....	49
5.1.1	Third Party Financing.....	49
5.1.2	Governments' Budgeting Arrangements.....	50
5.1.3	Bulk Purchasing.....	51
5.2	Market-Pull by Cooperative Technology Development Projects.....	52
5.2.1	Competitions.....	53
5.3	Institutional Issues.....	52
5.3.1	Integrated Responsibility in Government Departments.....	52
5.3.2	Information Dissemination.....	53
5.3.3	Training.....	54
5.3.4	Product Energy Labelling.....	55
5.3.5	International Cooperation.....	55
6	FINDINGS.....	57
7	Bibliography.....	61
8	ANNEX.....	63
	Summary of CTI Country Activities.....	64

1 SCOPE OF THE STUDY

This study is one part of an effort which the member countries¹ of the Climate Technology Initiative (CTI) are undertaking on Enhancing Markets for Climate Friendly Technologies. This study focusses on the technologies which governments' purchase for use in their own facilities, and identifies opportunities for purchasing climate friendly technologies. The study highlights the practical opportunities for governments to purchase climate friendly technologies, and draws governments' attention to the impact which their purchasing decisions can have on the market for these technologies. If CTI governments purchase climate friendly technologies wherever possible, their purchasing power could significantly increase demand for these technologies, and make a very positive impact on their market.

Climate friendly technologies are, for the purposes of this study, those technologies which reduce energy consumption, or which convert renewable sources of energy into heat or power, and which therefore lead to reduced emissions of greenhouse gases, in particularly carbon dioxide (CO₂) - the major greenhouse gas.

The study looks at the activities of both central and local governments in CTI member countries and examines energy use in buildings and appliances in government offices, public housing, schools and institutes of higher education, police and fire stations, prisons and corrective centres, hospitals and residential care homes and military sites. It also examines the fuel choices available for government or public sector vehicle fleets (including publicly owned agencies such as the postal service) and buses.

The following climate friendly technologies are covered:

- buildings:** *heating and cooling* : the use of building design to exploit renewable energy technologies such as passive solar, and so reduce the need for fossil-fuel based conventional heating and cooling technologies; the deployment of renewable energy technologies such as solar thermal, photovoltaic (PV) and biomass; the use of high performance windows; technologies such as combined heat and power (CHP); energy efficient boilers; heat pumps; and efficient air conditioning systems;
lighting: use of high frequency lighting, central controls, occupancy sensors;
- appliances:** *office technologies*: photocopiers, fax machines, computers, printers, monitors;
other appliances: refrigerators;
- vehicles:** fuel efficiency and/or the use of alternative fuels in central and local government vehicle fleets and public sector agencies; alternative fuel buses;
- communications:** use of PV for remote telecommunications and military sites.

¹ The member countries of the CTI include: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, The Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States of America. The European Commission also participates.

2 GOVERNMENTS' ROLE AS PURCHASER

In several IEA/OECD member countries the national government is either the largest or one of the largest single actors in the economy, accounting for 10-25% of GDP²¹. In Canada, for example, the Federal Government has an annual energy bill exceeding CA\$ 800 million, with 59,000 buildings and facilities, and 25,000 motor vehicles costing CA\$21 million and emitting 92 kilotonnes of CO₂, and annual purchases of goods and services costing over CA\$8 billion. This scale of purchasing is not untypical of many IEA/OECD countries. If governments as purchasers of a wide range of technologies systematically choose climate friendly technologies for use in their own buildings and vehicles, the potential for governments to have a major impact on the technology market for environmentally friendly products would be substantial.

Because governments have a significant market share in IEA/OECD countries, their purchasing power, if directed towards climate friendly technologies, could create increased demand for these products, and enable the technology manufacturers to move towards mass production of their products. For some technologies the higher capital costs of climate friendly products, in comparison to higher energy consuming products, is a major barrier to their more widespread deployment. Mass production would lead to reduced manufacturing costs and reduced product prices, and would improve prospects of more widespread deployment of the technologies.

2.1 Leadership

In recent years governments of leading industrialised nations have recognised that their activities in their own estate are important for setting an example to industry, commerce and the public. For instance, Chapter 4 of Agenda 21 (the framework for sustainable development in the next century agreed at the Rio Earth Summit in 1992), emphasises the important role which government purchasing can play in addressing the wider issue of unsustainable consumption and production patterns, of which climate change is one manifestation. As a result OECD member countries agreed in 1996 to improve the environmental performance of Governments^b in which leadership through government purchasing is given a prominent place. OECD member governments have recognised that their purchasing decisions not only make a direct impact on the market in terms of level of sales, but also send signals to other key stakeholders in relation to their energy and environment objectives. OECD Governments recognise that it is difficult to advocate responsible environmental behaviour to others if they are not taking the same measures closer to home.

2.2 Objectives of Government Purchasing Programmes

In many instances governments' purchasing strategies are motivated not by the objective of enhancing the markets for climate friendly technologies, but by the aims of finding financial savings and meeting their domestic and international environmental objectives. For most other IEA/OECD countries these environmental objectives arise from the need to meet the requirements of the UN Framework Convention on Climate Change (1992), which has stimulated governments' programmes for reducing national CO₂ emissions. Activities to reduce energy use in the government estate are part of the national programme to meet these

^bOECD, C(96)39/FINAL: Council Recommendation *Improving The Environmental Performance of Governments*.

international environmental commitments. In addition, and more broadly, governments' purchasing policies may also lie within an overall sustainable development strategy arising from countries' commitments made at the Rio Conference in 1992.

However, statements by governments about the importance of meeting these environmental objectives are not currently matched by commitments to deploy climate friendly technologies. As mentioned previously, climate friendly technologies encompass both technologies which use energy efficiently, thereby minimising emissions of CO₂, and technologies which utilise renewable sources of energy, or higher-efficiency clean generation technologies. In the short to medium term, renewable energy can help to increase diversity of energy supplies worldwide but is unlikely to provide a significant proportion of energy supplies overall. Nevertheless the increased contribution of renewable energy and clean generation technologies to global energy use is seen by many as one of the most important changes required to move towards sustainable development.

In drawing governments' attention to their existing purchasing choices, this study informs governments of the options for choosing a climate friendly technology, and demonstrates that the scale of technology purchasing by governments could be a significant factor in enhancing the market for climate friendly technologies. Governments' purchasing choices range from major decisions, such as the choice of a boiler for space heating and hot water in a new or refurbished building, to decisions about improving the energy efficiency of a building's lighting, the choice of new computers in an office, or washing machines in a residential care home. Such choices are influenced by several factors:

- ◆ *cost* (generally the overriding factor): this may not be limited to just the capital costs, so running costs will also affect the decision;
- ◆ *technology availability*: this includes basic knowledge of which technologies are available, and how they can be installed and maintained;
- ◆ *the performance of a technology*, in terms of its ability to meet the users' needs, to reduce running costs and to be maintained;
- ◆ the *perceived risk* of purchasing a technology whose track-record is not well proven in the same applications as the intended use.

2.3 Governments' Objectives In Enhancing the Market for Climate Friendly Technologies

In addition to measures taken within the government estate, Energy Departments in most IEA/OECD member countries have over the years implemented programmes to encourage the development and deployment of renewable energy technologies, and energy efficient technologies on a national scale. In encouraging the renewable energy industry and the increased use of energy efficient technologies, governments have supported a variety of programmes ranging from research and development projects, through to subsidies, tax relief, rebate schemes, information programmes etc. to enhance the deployment of such technologies. Through these programmes governments have been seeking to:

- ◆ strengthen the renewable energy industry's technical capabilities to achieve successful technical advances;

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- ◆ build up the renewable energy technology industry to be self sustaining and competitive in the marketplace;
 - ◆ gain a strong technology supply industry which will be able to compete in the international technology market;
 - ◆ contribute to meeting the national environmental goals for greenhouse gas emission reductions, and a sustainable energy supply;
 - ◆ comply with environmental standards for conventional pollutants, etc. by achieving concomitant reductions in sulphur dioxide, oxides of nitrogen, and particulate emissions, achieve improved water quality etc.

Governments recognise that the increased deployment of renewable energy technologies and other climate friendly technologies is essential if they are to meet their environmental objectives for limiting greenhouse gas emissions, and working towards a sustainable energy economy.

3 BARRIERS

3.1 Financial Barriers

Many renewable energies are not currently competitive in cost terms in comparison with natural gas and other fossil fuels. In many countries current electricity prices do not fully reflect the real long-term costs of provision. If the costs of external factors, such as environmental impacts or energy security measures, could be reliably incorporated into energy system costs, renewable energy technologies would become more cost competitive¹⁹. This issue is directly reflected in the decisions which purchasers make when considering replacement technologies. The *capital cost* of high-efficiency fossil-fuel fired technologies can be higher than less efficient alternatives, and with the relatively low costs of fossil fuel energy, initial cost comparisons between the options can lead purchasers to buy low-efficiency technologies. However if the life-cycle costs of the system are assessed, incorporating the reduced running costs over the system lifetime, many climate friendly technologies can be more cost effective today than existing technologies. Some technologies have, however, gained a niche market and have become cost competitive in certain circumstances. For example, PV when used in remote locations is cost competitive in comparison with the costs of linking the location with the electricity grid or using conventional stand alone equipment.

In addition, neither the technology purchaser nor the user is credited for the national environmental benefits which will accrue from the use of the technology. Until the “larger” government system credits users for their choice of a climate friendly technology because of the environmental benefits, purchasers will continue to perceive only the higher capital costs of the technologies. There must, therefore be some means of “rewarding”, or at least reimbursing, the purchaser to provide a “level playing field” for green technologies.

Because climate friendly technologies remain, in many cases, a higher capital cost purchase than their more polluting alternatives, the market for the technologies remains small. Until the market for these technologies grows, large-scale production is usually not possible, preventing economies of scale and a reduction in the price of the technology. Once the small production companies grow, increased demand and increased sales should translate into lower production and also marketing costs, which comprise a significant part of today’s purchasing price.

Some climate friendly technologies are not significantly more expensive to purchase than less efficient alternatives. For example, energy efficient office and household appliances are not necessarily more expensive than their less efficient rivals, and increased deployment of these technologies could be more easily achieved through increased information dissemination, and through government purchasing programmes which can encourage further uptake of the technologies. Given the wide area of governments’ responsibilities, their field of influence is also very wide. Procurement of climate friendly technologies on a systematic basis would help stimulate demand for the products and help to lower the technology’s capital costs. The potential markets for such technologies are enormous, so any increase in their use as a result of government purchasing offers a strong boost to the industry.

Within governments there are some barriers which result from the *financial or institutional arrangements* which inhibit them from purchasing climate friendly technologies. This is because cost effective arrangements which could overcome the initially higher capital costs and which would enable governments to purchase these technologies, can not easily be made; for example:

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- although energy efficient technologies may have higher capital costs they also have much lower running costs than a conventional technology, but this *cost-saving factor is not taken into account* in many government organisations where the budget structure may be such that any savings made in running costs will benefit a leasing company or department of Public Works, rather than the department which makes the capital purchase. Thus one department has to spend more for the capital cost of the technology, where another department benefits from the energy and running cost savings;
 - some *governments' budget structures* discourage departments from pooling their orders for technologies. Significant capital cost savings could be made if central and local governments could form buyer groups to make bulk purchases of specified products, and thereby achieve cost discounts from manufacturers. In addition, bulk orders from a group of organisations guaranteeing a purchase over a number of years give manufacturers some security, because they know where at least some of the demand for their products will come from, over that period;
 - *building leasing arrangements* usually require the renegotiation of a lease when changes are made to energy practices, and private sector tenants in such buildings would have to agree to any energy management changes, which may be difficult to achieve. In addition, management fees for building space are sometimes paid as a percentage of costs offering little incentive for departments and agencies to reduce running costs;
 - in many central and local governments *short-term financial considerations* prevail: a contract may be awarded to the lowest tender, irrespective of other important factors such as long-term savings and environmental impacts.

Some examples of governments' activities to overcome these barriers can be found in *Section 4*.

3.2 The Information Barrier

Government purchasers, just like other purchasers of technology, make decisions based on information such as: how effectively a technology performs in relation to the purchaser's needs, the capital and running costs, how easy it will be operated, and how good the maintenance and after-service will be once it is installed. However, gaining comparable information on all these criteria may not be at all easy for technologies which are not widely available on the market.

Utilities play an important part in influencing purchasers' technology choices and their promotional support for a climate friendly technology can be critical to its success. Utilities have a captive audience of customers who are sent inserts and promotional literature with their bills, about space and water heating systems and other energy products. Their support for climate friendly technologies has been shown to be very influential when demand side management measures have been adopted by utilities, and when incentives have been offered to customers to buy products such as energy efficient light bulbs (see lighting case study in Guadeloupe, *section 4.3.8*), and heat pumps in the US (*section 4.3.5*).

In addition to the role of the utilities in disseminating information about climate friendly technologies, *general information* about the technologies is a critical factor in influencing

purchasers' decisions. Purchasers will often opt for a new product from a company with which they are familiar, from whom they receive good service, and whose products are not noticeably more expensive than their nearest competitor. If a new boiler is needed, a newer model is likely to be more efficient than the one it is replacing, but other more radical options would probably not be investigated, such as installing CHP technology, a heat pump, a condensing boiler, buying a smaller boiler after improving the insulation and draught proofing of the building, or using solar thermal technology for some part of the operation.

In many countries purchasers do not have easy access to information about climate friendly technologies, and so they opt for the easy option thus losing the opportunity to reduce still further their greenhouse gas emissions. Adequate training of government purchasers to inform them at regular intervals about the climate friendly technologies which are available, would be an effective means of ensuring that informed choices are made. Information dissemination among technicians such as boiler operators, electricians and plumbers can be important for raising awareness of the characteristics and environmental and energy benefits of the climate friendly technologies, and encouraging these technologies to be considered as viable alternatives to conventional appliances.

The information barrier can also extend to *ignorance about incentive/promotional* campaigns which exist in some countries. These range from low-interest loans and tax credits to utility rebates and other forms of government subsidy, and these are often not well known nor extensively promoted. Significant opportunities for expanding the climate friendly technology market are therefore lost by poor promotion of these programmes.

Risk

Even when the information barrier has been overcome, purchasers are frequently reluctant to invest in technologies whose benefits and running costs are not yet well known. Purchasers are understandably unwilling to risk technologies which may prove not to fulfill the user requirements, may break down and cost more to maintain than expected, and may soon become obsolete. For public purchasers this risk is reinforced by their position as spenders from the public purse. Conservative decisions may be motivated by the fear of technology failure (particularly in relation to renewable energy technologies which are viewed as untried technologies), and criticism of the government spending tax payers' money on ineffective technologies. In practice most of the energy efficient technologies and many of the renewable energy technologies available for deployment can be considered mature as they have already achieved a track record in a variety of applications. The technologies are now waiting for widespread deployment to achieve cost reductions and a genuinely competitive position in the market.