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TABLE RONDE NATIONALE SUR L'ENVIRONNEMENT ET L'ÉCONOMIE

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OPTIONS TO IMPROVE THE TAX TREATMENT OF INVESTMENTS IN ENERGY EFFICIENCY AND HEATING AND COOLING FROM RENEWABLE SOURCES

A study commissioned by the
National Round Table on the Environment and the Economy

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The views expressed herein are solely those of the Pembina Institute.

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EXECUTIVE SUMMARY

The 1996/97 Federal Budget Plan makes a commitment to improving the treatment of investments for energy efficiency and other renewable energy projects.

The purpose of this study is to identify, assess and present options to improve the tax treatment of investments in energy efficiency and in heating and cooling from renewable energy resources. The main objectives of this study are to identify barriers to be addressed, select key measures for analysis, highlight important design considerations and the nature of possible impacts, and recommend tax measures.

This paper will serve as a basis for discussion at the NRTEE 1996 Greening of the Federal Budget Workshop, which aims to:

- clarify the state of the debate on selected issues; and
- where possible, reach consensus among workshop participants on the implementation of new tax provisions.

The study identifies barriers to investment related to lack of awareness of energy efficiency opportunities and paybacks, lack of incentive to make investments and/or lack of capital with which to proceed. Tax barriers play a key role, particularly due to incentives provided to energy supply options, and low capital cost allowance rates afforded to investments in energy efficiency and heating and cooling, including from renewable sources.

A slate of optional tax measures are identified, and a number of optional non-tax measures for context. Optional tax measures were initially screened to determine if they fit within the scope of the study, by meeting the following criteria:

- federal tax measures (i.e. not provincial, not non-tax);
- energy efficiency and/or heating and cooling from renewable sources;
- buildings and operations, not transportation; and
- commercialization and implementation, not research and development.

The measures were then screened for their ability to be implemented in the near term. The tax measures that were selected for detailed analysis in this study are:

1. Energy Audit Tax Credit
2. Investment Tax Credit for Energy Efficiency and Heating/Cooling from Renewable Energy
3. RRSP Loan for Energy Efficient Homes
4. CCA for Energy Efficient Buildings
5. CCA for Energy Efficiency Equipment
6. CCA for Heating/Cooling from Renewable Energy
7. CCA for Manufacturing and Processing (M&P) Equipment
8. Reduced Rate of Tax for Energy Efficient M&P
9. Deductibility of Business Energy Operating Costs
10. CCA for District Energy

The assessment results in the recommendation to pursue all but measures 8 and 9. Key design issues centre around the availability of energy efficiency standards on which to base the measures, appropriate design to minimize administrative burden, and the selection of appropriate rates to induce the desired behaviour but remain financially manageable.

Other tax measures that appear promising but were not selected for detailed review in this study are:

- adding a Canadian Development Expense component to the Canadian Renewable and Conservation Expense;
- further relaxing, or removing, the Specified Energy Property Rules associated with CCA Class 43.1; and
- including energy efficiency (as well as generation) in the Canadian Renewable and Conservation Expense.

Promising complementary non-tax measures include:

- energy efficient mortgages;
- energy efficiency retrofit revolving fund;
- expanded C-2000 program;
- expanded builder training programs;
- energy efficiency product and building labeling;
- industrial motor challenge;
- comprehensive energy efficiency standards;
- green equipment procurement; and
- feebates for energy efficiency equipment.

The task ahead is for parties to work together to develop a package of measures that complement and do not duplicate nor contradict one another. It is hoped that this paper helps further this necessary work to improve the treatment of investments in energy efficiency and heating and cooling from renewable sources.

CONTEXT

The 1996/97 Federal Budget Plan makes a commitment to improving the treatment of investments for energy efficiency and other renewable energy projects. The preliminary results of the Natural Resources Canada Level Playing Field Study[1] show that investments in energy efficiency and heating and cooling from renewable sources are disadvantaged by the current tax system, in comparison to conventional energy supply and other alternatives. Much work has been underway within government and among stakeholders to identify barriers and make adjustments to the tax system. A number of processes are ongoing at this time, related to the tax treatment of renewables and energy efficiency. Refer to Appendix A for an itemization of related processes.

This paper will serve as a basis for discussion at the NRTEE 1996 Greening of the Budget Workshop, which aims to:

- clarify the state of the debate on selected issues; and
- where possible, reach consensus among workshop participants on the implementation of new tax provisions.

Following the stakeholder workshop, the Chair of the NRTEE intends to provide concrete recommendations to the Minister of Finance, as input into the development of the 1997/98 Federal Budget. It is hoped that the measures discussed in this paper might form the basis of some of those recommendations.

Purpose and Scope

The purpose of this study is to identify, assess and present options to improve the tax treatment of investments in energy efficiency and in heating and cooling from renewable energy resources. The main objectives of this study are to identify barriers to be addressed, select key measures for analysis, highlight important design considerations and the nature of possible impacts, and recommend tax measures.

The scope of the study is intended to:

- focus on buildings and operations;
- exclude the transportation sector;
- focus on commercialization and implementation, rather than research and development; and
- highlight alternative or complementary non-tax options to provide context, but refrain from any detailed analyses.

These restrictions were established by the NRTEE to make the study manageable within a limited timeframe, and to focus on commitments made in the 1996/97 Federal Budget. The tax treatment and non-tax options related to transportation and alternative

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[1] Energy Sector, The Level Playing Field - The Tax Treatment of Competing Energy Investments. Ottawa: Natural Resources Canada, 1995.

fuels are very important, but need to be addressed outside this study. The same applies to non-tax options in general.

Refer to Appendices B,C, D and E respectively for the study methodology, interviewees, and references, and a glossary of acronyms.

Goals for Tax Measures in Support of Energy Efficiency and Renewables

Measures need to be selected and considered in the context of what they are trying to achieve. Goals for energy-related tax measures in general are to:

- continue to work towards a level playing field between alternative and conventional energy supply, and between energy efficiency/conservation and supply;
- provide a foundation for other measures and government goals to succeed, such as corporate response to the climate challenge, and goals regarding increased employment and improved eco-efficiency;
- be part of a process towards ecological fiscal reform (EFR)[2], including ecological tax reform; and
- drive continuous improvement in energy efficiency and eco-efficiency (less input and waste output per unit of desirable product or service).

Goals related to the specific energy applications within the scope of this study are to:

- encourage increased demand for cost-effective energy efficient products and equipment;
- work to increase the proportion of energy efficient buildings in the existing and new building stock, in both the residential and commercial sectors;
- encourage more investment in heating and cooling from renewables; and
- promote, or at least do not disadvantage, district energy.

Issues and Trends

Relevant issues and trends point to the context in which any measures would be introduced, and help to focus on the areas where measures are needed and influence their design. Some key issues and trends, and their implications for consideration in this study, are highlighted below. This discussion is based on the consultants' current understanding from a variety of sources. Specific items are referenced.

Issues and Trends	Implications
<u>Economic, Fiscal and Investment</u>	
• government budget constraints and downsizing, amidst efforts to reduce deficit	• measures such as infrastructure grants and tax credits are less likely to be acceptable, as are measures that

[2] Refer to: Resource Futures International, <u>Ecological Fiscal Reform - A Review of the Issues.</u> Ottawa: The National Round Table on the Environment and the Economy, 1995.

Issues and Trends	Implications
	involve a significant administrative effort
• continued high unemployment, and associated efforts to increase economic activity and jobs	• increases in labour intensive economic activities such as energy efficiency retrofits would have broader socio-economic benefits and political appeal
• much discussion of and work towards increased reliance on industry self-regulation and voluntary actions in a variety of resource-based industry sectors in Canada	• economic instruments and tax measures take on an even greater importance in an environment with reduced emphasis on regulation
• efforts to simplify the tax system and identify and correct imbalances between energy options	• practical measures are needed to address the tax disadvantages posed to energy efficiency and renewables
• limited funds are available for investment	• strong competition for investment dollars make tax implications even more important
Taxation	
• all assets related to buildings, regardless of their useful lives or contribution to energy efficiency, are currently allocated to CCA class 1, at 4% per year	• this compares to rates of 20% in class 8 (miscellaneous assets) and 30% in class 43 (manufacturing and processing) and 43.1 (renewables and energy conservation)
• CCA Class 43.1 for Energy Conservation Property and CRCE, which stands for "Canadian Renewable and Conservation Expense" are almost entirely focused on energy supply	• these tax measures, the only ones specifically pertaining to renewables and efficiency, include very few energy efficiency and conservation expenditures in their provisions
• Class 43.1 does not include district energy, as did the former class 34, (so these assets fall into class 1 at 4%)	• district energy, which tends to be energy efficient and may use renewable energy sources, is disadvantaged by the tax system
• NRCan Level Playing Field[3] case studies indicate that energy efficiency is disadvantaged by the tax system, whereas supply options receive varying	• new or revised measures need to address this, or existing measures need to be removed

[3] Op. Cit.

levels of "uplift" relative to a neutral tax system (for example, the largest differential is 30%, between an oil sands project and a building retrofit)	
• NRCan Level Playing Field[4] case studies show that a possible investment in a solar wall was disadvantaged by the tax system, with an 8-22% differential between it and various supply options	• there is a need to correct the tax disadvantage posed to heating and cooling from renewables
• energy efficiency investment decisions do not tend to focus on tax implications	• it may take significant shifts, e.g. in rates of deduction, to obtain the desired response
<u>Energy Demand & Supply</u>	
• energy use continues to increase faster than efficiency gains in all sectors (Refer to Appendix F on Energy Use and Efficiency Trends)	• significant efficiency improvements are needed and possible
• Canada will not meet its climate change commitments under current trends; the National Action Plan on Climate Change relies heavily on voluntary action by business	• significant action is needed to reduce energy consumption and emissions, and economic instruments and tax measures must be aligned with goals; it is necessary to address the existing building stock and operations, as well as new buildings and activities
• there is an over-capacity among many electric utilities in North America; combined with a trend towards restructuring and more competitive electricity markets, this is resulting in falling or flat electricity prices	• both of these factors make investments in demand side management and increased renewable supply less appealing to consumers and utilities; economic instruments and tax measures are needed to encourage appropriate behaviour
<u>Energy Efficiency and Renewable Energy Technology and Standards</u>	
• there is a fast rate of technological change, in terms of the development, introduction, and improvement of energy efficiency and renewable energy technologies	• this supports the use of performance standards (instead of prescriptive standards) that are ratcheted up over time, for guiding and rating the use of energy-using equipment and structures

[4] Ibid.

• a variety of energy efficiency and renewable energy technologies have proceeded past the R&D stage and are commercially available and cost-effective, yet their uptake remains slow	• according to a number of stakeholders interviewed, a large part of the reason for this is due to information and investment (e.g. up-front cost) barriers
• some energy efficiency technologies and methods relate to specific pieces of equipment, but others are based on energy efficient methods of construction with conventional materials	• measure design must recognize that some energy efficient technologies are integral components of buildings, and not separately identifiable assets
• standards, codes, criteria and guidelines for building and equipment energy efficiency and certification of energy audits/auditors are at various stages of development (Refer to Appendix G on Energy Efficiency Standards)	• there is not one clear set of standards on which to immediately base a set of measures, but much is available to work with
• the cost-effectiveness of various renewable energy applications depends in part on the overall load (demand)	• the interplay between energy supply and efficiency must be recognized in introducing a basket of measures; an increase in energy efficiency may reduce the cost-effectiveness of some renewable (and non-renewable) energy supply options
<u>Buildings</u>	
• energy efficiency is not a main consideration for the vast majority of home buyers	• they may need other incentives to encourage an energy efficiency orientation
• gains have been made in energy efficient construction in the new residential sector, but standard current construction approaches are not necessarily following the most energy efficient techniques	• need to continue and increase the trend toward energy efficient construction
• housing starts are relatively low and there is a focus on renovation; there is generally a low energy efficiency in the existing housing stock (which cycles approximately every 50 years)	• the existing housing stock and changes to it need to be a major focus in improving energy efficiency in the residential sector
• a large underground market has developed for GST-free home	• a GST rebate on labour employed in energy efficiency retrofits may only

renovation labour	legitimize what is already occurring
• the commercial sector is lagging with respect to energy efficiency, although opportunities are there (e.g. C-2000 buildings use roughly half the energy at half the cost of the ASHRAE 90.1 requirements)	• buildings in the commercial sector need to be an area of focus, as well as residential rental apartments and industrial buildings
• the MUSH (municipal, university, school & hospital) sector is generally non-taxable	• most of this sector must be addressed through non-tax measures

Barriers to Address

In looking at barriers to investment in energy efficiency, heating and cooling from renewables, and renewable energy generation, it is useful to consider:

- the stage of production and use;
- the groups or sectors involved; and
- the type of barrier.

In this study, the stages are categorized as follows:

- research;
- pre-development (including feasibility studies);
- development;
- commercialization, construction, production;
- implementation/installation (including new construction and renovation); and
- operation and maintenance.

The groups are identified as:

- generators (of power from renewable sources);
- producers/suppliers (of energy efficient products and services);
- residential (owner as dweller);
- business (commercial and industrial buildings and rental apartments); and
- industrial (processes).

Barriers are classified as one of the following types, which are at times closely linked:

- lack of awareness (of energy efficiency and renewable energy opportunities);
- lack of incentive (to take action); and
- lack of capital (or access to capital, to make investments).

From among a range of barriers to energy efficiency and renewable energy, certain ones were selected that most closely relate to this study. They reflect the understanding of the authors from various sources, notably the study interviewees.

Barriers are often common across sectors, and may apply at different stages. The matrix in the next section links the various tax and non-tax options to the types of barriers, groups of players, and stages involved.

Lack of Awareness

Potential investors and consumers are often not aware of opportunities for energy efficiency savings, how assured they are, and the potential payback. They tend to be focused on the "basics" of running a home or business, neglecting the energy efficiency "basics".

A factor limiting investment in energy efficiency is the limited use of energy modeling or auditing by designers and contractors, to determine the potential efficiency increases and savings.

There are disincentives to constructing energy efficient buildings and carry out energy efficiency retrofits. Buyers lack awareness of the value of energy efficient buildings, so the markets are not placing a high enough value on this. With other market forces pushing costs down, developers are unable to invest in energy efficiency.

Lack of Incentive

A "split incentive" exists in the rental markets, where landowners do not have much incentive to make energy efficiency retrofits if tenants are incurring the energy operating costs, and tenants are not in a position to effect the retrofits. A similar situation exists in the commercial building sector. A related barrier is that home buyers are often only holding a house for a few years and will not be there to reap energy savings over the long term.

There is a disincentive to purchase and install equipment that is more energy efficient than the norm. This is due in part to the higher up-front cost, implying a longer payback period. Equipment and related assets receive the same CCA treatment regardless of energy efficiency. Also, energy efficiency is one factor that may be compromised within the host of factors such as initial price, cost and availability of fuel, and ease of servicing.

There is a lack of incentive to install equipment for heating and cooling from renewable energy resources, relative to a neutral tax system and the incentive provided for conventional energy supply.

There is a lack of incentive to implement district energy (which can often be energy efficient and sourced from residual energy) relative to other methods of conventional energy supply.

In general, CCA rates related to energy efficiency and heating and cooling from renewable sources are low, whereas 100% of energy operating costs (e.g. fuel) can be expensed in the year incurred.

Lack of Capital

Funds are not available, or access to financing is difficult, to apply to the initial capital investment in energy efficiency.

Available capital is diverted away from energy efficiency investments in favour of energy supply, because of significant differential tax treatment. This occurs in the oil & gas sector, where the business decision-maker has a strong incentive to spend available capital on expanding energy supply to increase revenues and get favourable deductions, rather than on energy efficiency equipment to decrease expenses.

The renewable energy sector has been constrained by the tax system in terms of gaining access to capital and receiving favourable treatment of deductions. Tax measures have been in place for oil & gas and mining that have not been applied to the renewable energy sector. Steps are being taken to address this uneven playing field, as described in Appendix H, Existing Tax Provisions.

2. OPTIONS AND SELECTION OF TAX MEASURES

Measures explored in this study were selected from a broader list of options, which is highlighted in the matrix below. The long list was generated from: measures identified by various stakeholders and government to address climate change, proposed measures submitted to government by stakeholders, examples of measures from other jurisdictions, and ideas of the consultants and interviewees for adding to or adjusting existing tax measures. Optional measures fall into two categories: tax and non-tax.

Tax Options

Tax measures are one of three types, and are identified as such in the measure descriptions:

- deductions: measures that focus on the costs that may be deducted in determining taxable income, in terms of: which taxpayers are eligible for deductions, what expenditures may be deducted, and the amount and rate of the deduction;
- rate of tax: measures related to the rate at which income or capital is taxed; and
- credits/rebates: measures concerning tax credits, or rebates of the tax that would otherwise be payable.

Selection of Tax Measures for Detailed Analysis

Optional measures were initially screened to determine if they fit within the scope of the study, needing to be:

- federal tax measures (i.e. not provincial, not non-tax);
- related to energy efficiency and/or heating and cooling from renewable sources;
- concerning buildings and operations, not transportation; and

- focused on commercialization and implementation, not research and development.

The measures were then screened for their ability to be implemented in the near term, based on the extent to which they are:

- in keeping with tax policy and the existing system;
- politically acceptable, and lacking significant stakeholder opposition;
- deemed as desirable by involved industry sectors; and
- able to be designed to be fiscally manageable.

The tax measures that were selected for detailed analysis in this study, on the basis of their ability to meet the above criteria, are:

1. Energy Audit Tax Credit
2. Investment Tax Credit for EE and HC/RE
3. RRSP Loan for Energy Efficient Homes
4. CCA for Energy Efficient Buildings
5. CCA for Energy Efficiency (EE) Equipment
6. CCA for Heating/Cooling from Renewable (HC/RE) Energy
7. CCA for Manufacturing and Processing (M&P) Equipment
8. Reduced Rate of Tax for Energy Efficient M&P
9. Deductibility of Business Energy Operating Costs
10. CCA for District Energy

These measures are in bold (with their number in parentheses) in the matrix of options at the end of this section and are described in detail in Section 3. In Section 3, each measure is presented in a one-page Measure Description table. The table outlines the measure, the rationale for the measure and goals trying to be achieved, precedents in terms of other measures within the tax system, issues and design considerations, eligibility, and design parameters in terms of qualifying expenditures and the rate of tax, deduction, or credit.

The tax measures excluded from detailed analysis are described in Appendix I, with the rationale for their exclusion.

Non-Tax Options

Non-tax measures are described in Appendix J, where they are classified into the following three types:

- program: measures involving direct (internal) federal government action, and spending on programs in which others participate (such as education and information transfer initiatives);
- financial/economic: measures that make use of financial mechanisms and economic instruments; and
- standards & regulations: measures that are based on mandatory standards and regulations, with enforcement mechanisms as required.

Non-tax measures are provided for context, as they may be desirable in conjunction with tax measures to improve results, or as alternatives to tax measures where more appropriate and less costly. The more common ones presented are by no means a comprehensive list.

The Matrix of Options on the following page links the tax and non tax options to the stage of energy supply and use, the main group that would be targeted and affected by the measure, and the type(s) of barriers being addressed.

MATRIX OF OPTIONS

Stage	Group	Barrier	Tax Options	Non-Tax Options
Research	G,P	C	• simplify SR&ED	• financial assistance & partnerships • government research
Pre-Development	G,P	C	• improve & expand CRCE • reduce or remove CEE	• financial assistance & partnerships
Development	G,P	C	• add "CRCDE" • reduce or remove CDE	• financial assistance & partnerships
Construction/ Commercialization	G	I,C	• remove SEPR • partial PUITTA rebate • ITC for renewables	• infrastructure grants • green energy procurement • electricity market rules • emission trading, caps, and permits
	P		• **CCA for DE (10)**	• green equipment procurement
Implementation/ Installation	R,C,I	A,I	• **energy audit tax credit (1)**	• audit software • information/education • product/building labeling • codes and standards • feebates • green communities
	R,C,I	I,C	• **tax credit for EE, HC/RE investments (2)** • GST and PST rebates	• EE revolving fund • grants, low-interest loans
	R	I,C	• GST rebates - homes, retrofits • **RRSP loans - homes, retrofits (3)**	• EE mortgages
	C	I,C	• **CCA for EE buildings (4)** • **CCA for EE equipment (5)** • **CCA for HC/RE expenditures (6)**	• expand C2000 • expand builder training • expand FBI
	I	I,C	• **CCA for M&P (7)** • **reduced tax rate for EE M&P (8)**	• industrial motor challenge
Operation & Maintenance	R,C,I	I	• carbon tax	
	C,I	I	• **deductibility of energy expenses (9)**	
	C	I	• rental income from EE properties	

Groups
G = generators of electricity and other forms of energy
B = business (commercial, industrial, and residential rental buildings)
P = producers of energy efficient products, ESCOs, and DE
R = residential buildings
I = industrial and commercial operations and processes

Barriers
A = lack of awareness
I = lack of incentive
C = lack of capital

3. DESCRIPTION OF SELECTED MEASURES

MEASURE: 1. Energy Audit Tax Credit

Tax credit for initial review and analysis activities, such as energy modeling and audits of buildings and operations, needed to identify cost-effective energy efficiency investments.

RATIONALE/GOALS

- overcome initial barrier to energy efficiency investment based on lack of information and reluctance to gamble on savings being available
- relatively small investments required to demonstrate the real economic benefits of larger energy efficiency investments

PRECEDENTS

- energy efficiency/retrofit grant and loan and related programs (e.g. CHIP, RRAP)
- other tax credits, including ITCs (Investment Tax Credits)

ISSUES/DESIGN CONSIDERATIONS

- need to avoid an administratively cumbersome measure
- need to apply a minimum requirement for audit process, standards, certification
- enable verification that audits are conducted and acted on by requiring taxpayers to keep proof of the audit expense on file, and proof that a minimum set of recommendations were acted upon (such as those with less than a two year payback period)

ELIGIBILITY

- homeowners (of principal residences) in Canada
- owners of Canadian rental properties
- owners of commercial building sites
- owners of industrial facilities
- property owners/developers preparing building plans through certified professionals

DESIGN PARAMETERS

Qualifying Expenditures

- building energy audits and pre-construction energy modeling
- commercial operation and industrial manufacturing/processing audits
- conducted in accordance with specified standards or protocol
- conducted by a certified energy auditor

Rate

- cover all or a portion of the cost of audits within certain guidelines and to a maximum limit, such as is done with coverage of medical procedures
- differentiate between types of modeling or audits, such as 100% of individual residential, 80% of apartments, commercial buildings, and buildings on an industrial site, and 25-50% of industrial processes
- option: instead of identifying the percent coverage with the type of audit site, set the percents based on the cost of the audit, e.g. 100% of audits costing up to $150, 40% of audits costing up to $10,000, and 10% of audits costing over $10,000

MEASURE: 2. Tax Credit for Investments in Energy Efficiency, and HC from RE

Tax credit for energy efficiency investments in buildings and/or operations, and/or in investments in heating and cooling from renewable energy resources.

RATIONALE/GOALS

- overcome barrier of not allocating the up-front capital required to make the initial energy efficiency investment, or related barrier of access to capital
- overcome investment barrier of other alternatives receiving more favourable tax treatment, or appearing more favourable for other reasons such as a quicker payback period
- increase the relative market penetration of renewable-source heating and cooling mechanisms

PRECEDENTS

- energy efficiency grant, loan and related programs (e.g. CHIP, RRAP)
- energy source substitution programs (e.g. COSP,PUSH)
- other tax credits, including ITCs (Investment Tax Credits)
- heating used to be included in CCA class 34 (predecessor of CCA class 43.1)
- CCA class 43.1 concentrates on alternative energy, including renewables, but focuses on generation, not use

ISSUES/DESIGN CONSIDERATIONS

- need to carefully define which investments qualify and which do not
- possibility of making it a refundable tax credit; if so, need to determine how to handle it administratively, including treatment in the case of transfer of ownership of property
- need to minimize free riders, who would have made the investment anyway due to their knowledge of potential energy efficiency gains and operating savings, and due to their access to capital
- need to choose between this and other measures; or design appropriately so there is no overlap, such as having this measure apply to non-rental residential only (the latter is excluded from the other measures, as CCA is not applicable)

ELIGIBILITY

- homeowners (of principal residences) in Canada
- developers of residential housing in Canada
- owners of Canadian rental properties
- owners of commercial and industrial buildings and facilities

DESIGN PARAMETERS

Qualifying Expenditures

- expenditures on capital, labour, and other costs associated with energy efficiency investments in buildings and operations
- anticipated energy efficiency results must be provided by certified professionals
- anticipated results, or performance of equipment, must exceed specified standards by a given percentage (or other amount)
- heating and cooling equipment (and components and related expenditures) must meet qualifications, such as employing passive solar or biomass mechanisms
- possibly require that a certain portion of the building or its energy use meet these qualifications in order for the taxpayer to be eligible

Rate

- partial tax credit in the form of a percentage of the expenditure made, such as 10 or 20%

MEASURE: 3. RRSP Loan for Energy Efficient Homes

An incremental amount that may be borrowed by a prospective homeowner from their RRSP, for the purchase of an energy efficient home.

RATIONALE/GOALS

- to encourage people to demand and purchase energy efficient homes
- help people to finance the purchase of an energy efficient home
- to encourage awareness of, and construction and marketing of energy efficient homes
- to encourage the value of energy efficiency being reflected in the price of homes
- the amount, reimbursed into the RRSP over time, can be generated through operating savings resulting from increased energy efficiency

PRECEDENTS

- currently, $20,000 may be borrowed from the RRSP of a first-time homeowner, applied against the down-payment, and then paid back into the RRSP over 15 years (or claimed as income)
- the former RHOSP (Registered Home Ownership Savings Plan) was a mechanism by which the interest on savings toward the purchase of a home was tax sheltered
- R-2000 home energy efficiency standards are well established; HERS (Home Energy Rating Systems) have been developed in the United States and are under development in Canada

ISSUES/DESIGN CONSIDERATIONS

- homes must meet specified energy efficiency performance standards, demonstrated objectively
- standards are available to work with in developing one consistent measurable energy efficiency performance scheme on which to base a tax measure
- government would pass on the energy auditing function to third parties, and make the proof on an honour system with the filing of a certification document, to reduce administrative burden
- energy auditing standards and certification programs for professionals in energy efficiency are under development; guidelines, procedures, and training courses have been put into action
- a consideration is to extend the qualifying expenditures beyond the down payment of an energy efficient home, to also allow this transfer for energy efficiency retrofits

ELIGIBILITY

- prospective homeowners in Canada
- not restricted to first-time buyers and not only once per lifetime, but must be for principal residence

DESIGN PARAMETERS

Qualifying Expenditures

- for the purchase of the principal residence only; home may be new or previously owned
- applied to the down payment of a home that qualifies from an energy efficiency standpoint
- possibly allow application to the capital costs of energy efficiency upgrades and renovations

Rate

- $5,000 or $10,000 per taxpayer
- in the case of first home purchases, incremental to the existing $20,000 maximum allowance
- as with the existing allowance, the amount must be repaid into the RRSP over a specified number of years

MEASURE: 4. CCA Rate for Energy Efficient Buildings

A higher Capital Cost Allowance rate for commercially owned buildings (to which CCA applies) that meet or exceed a specified energy efficiency performance standard.

RATIONALE/GOALS

- move towards a level playing field between tax treatment of investments in energy efficiency relative to supply
- induce the construction and retrofitting of more energy efficient buildings

PRECEDENTS

- qualification for CCA class 43.1 of cogeneration equipment meeting or exceeding a prescribed heat rate requirement
- accelerated write-offs for energy supply investments
- energy efficiency ratings, codes, standards and criteria (e.g. home energy rating system, national energy code for buildings, R-2000, C-2000)

ISSUES/DESIGN CONSIDERATIONS

- availability of energy efficiency standards for commercial buildings
- availability of performance-based energy efficiency standards, as well as prescriptive
- energy audit protocol and standards; energy auditors' certification
- retrofitting of existing building stock versus new construction
- need to include the cost of labour inputs in energy efficiency upgrades
- whether to include the whole cost of the building (which is more easily tracked) or the incremental cost (which is more targeted and less costly to government) or a proxy for the latter such as 10% of the total cost of the building
- many materials that contribute to energy efficient buildings are not specialty energy efficiency materials; they must be combined in a particular manner and amount to achieve high energy efficiency
- need to design so that there can be no double-counting by taxpayers, should this measure and parts or all of other measures be adopted

ELIGIBILITY

- owners of commercial buildings in Canada, including commercial sites, industrial facilities, and rental apartments/houses, that meet the energy efficiency eligibility requirements
- preferably, eligibility would be based on a performance standard such as a certain energy performance or usage per square meter of space, which can be adjusted over time
- if necessary, due to lack of performance standards or for specific applications, prescriptive standards, such as a specified percentage above the existing minimum code, could be used

DESIGN PARAMETERS

Qualifying Expenditures

- the cost of entire buildings and their energy systems
- include capital, labour and other costs to the extent they are normally capitalized and included in the cost of a building

Rate

- set up as a subset of CCA class 1 (but at a higher rate than 4%), or as a separate class
- fix the rate, or have a sliding scale based on levels of energy efficiency performance relative to a minimum efficiency benchmark standard, or have a phased-in rate that declines over time (as the energy efficiency of the building stock increases)
- rate could be from, for e.g., 6-16%, depending on the amount deemed to be required to make a difference, but set at a manageable level of financial exposure to government.

MEASURE: 5. CCA Rate for Specified Energy Efficiency Equipment

A higher Capital Cost Allowance rate for specified capital expenditures related to energy efficient equipment used in buildings and operations.

RATIONALE/GOALS

- move towards a level playing field between tax treatment of investments in energy efficiency versus supply
- induce the purchase and installation of energy efficient equipment and components so that they become part of the building stock and related operations

PRECEDENTS

- other CCA rates, such as class 43 and 43.1, and class 8
- qualification for CCA class 43.1 of cogeneration equipment meeting or exceeding a prescribed heat rate requirement
- accelerated write-offs for energy supply investments, and write-offs of intangibles such as through CEE, CDE, and CRCE
- energy efficiency ratings, codes and standards (e.g. Energuide ratings for appliances, R-factors for insulation, performance ratings for windows, CSA and CGA standards)

ISSUES/DESIGN CONSIDERATIONS

- availability of standards for energy-using equipment and related expenditures; extent of use of performance based standards, rather than prescriptive standards
- fairly rapid rate of change in technology and standards; measure needs to be designed to keep up with these without needing to be revisited on an ongoing basis
- installation and utilization of the equipment (versus unused over-capacity); ideally the measure would have some sort of check to ensure that equipment will be appropriately sized and applicable to the situation
- need to place clear boundaries around what qualifies and what doesn't; the initial set-up and rules for future changes will be very important; must not overlap with other measures, as this may enable 'strategic behaviour' and /or double counting by taxpayers
- option of a sliding scale rate based on levels of energy efficiency, to give higher rewards for higher performance, reduce free riders, and facilitate estimation of cost to government
- option of a phased-in rate that is initially fixed at a higher rate to encourage early action, but then declines over time, eventually removing the tax incentive

ELIGIBILITY

- purchasers of equipment and components that meet qualification requirements and are installed for use in commercial and industrial buildings in Canada, including sites of business and rental apartments/houses

DESIGN PARAMETERS

Qualifying Expenditures

- the cost of specific energy efficient assets used in buildings and operations, such as boilers, furnaces, heat exchangers, water heaters and windows, that exceed existing regulated energy efficiency standards by a given amount (amount will vary by type of equipment)
- the capitalized value of labour to install the equipment and components

Rate

- include in CCA class 43.1 at 30% (versus current rates of 4-20%), or in a separate class

MEASURE: 6. CCA Rate for Heating and Cooling from Renewables

A higher Capital Cost Allowance for assets used in space and water heating and cooling from renewable sources and from residual energy (waste heat).

RATIONALE/GOALS

- to remove the disadvantage environmentally sustainable and efficient supply options face, in comparison with other energy options that receive better tax treatment
- to recognize the significance of heating and cooling as business costs with a high potential for operating savings

PRECEDENTS

- heating equipment used to qualify for class 43.1's predecessor, class 34
- equipment to harness waste energy from specified electricity generation and industrial processes for use in industrial processes qualifies for CCA class 43.1
- specified cogeneration equipment qualifies for CCA class 43.1

ISSUES/DESIGN CONSIDERATIONS

- must ensure this measure does not enable double counting if several measures are adopted
- definition of qualifying assets and related expenditures is very important
- need to treat retrofits and new installations: retrofits may be allowed to have a starting point of less efficiency, so that the residual energy is being captured instead of lost, but new facilities may be required to meet a certain efficiency standard so they are not unnecessarily generating residual energy
- must not inadvertently encourage or perpetuate energy inefficient processes, e.g. electricity generation and industrial processes that are unduly inefficient and therefore have a large residual energy (waste heat) component
- whether to include intra-industrial district heating, within or between industrial facilities, in this measure, particularly if the district heating measure is not adopted or is included in a class other than 43.1 (at a lower rate than the 43.1 rate for manufacturing and processing)
- need to address industrial and residential/commercial applications, recognizing that CCA class 43 and 43.1 are currently oriented towards manufacturing and processing

ELIGIBILITY

- industrial (manufacturing and processing) facilities in Canada
- commercially owned buildings in Canada, including sites of business, and rental apartments/houses
- privately owned (taxable) facilities used for municipal, educational, health, or related public services (i.e. in the MUSH sector: municipalities, universities, schools, hospitals)

DESIGN PARAMETERS

Qualifying Expenditures

- capital expenditures associated with heating and cooling from renewable sources, such as heating and cogeneration from biomass; passive solar space and water heating; geothermal heating; and water cooling (the renewable energy equipment would need to meet a minimum energy efficiency performance standard for the type of equipment)
- capital expenditures associated with the capture of waste energy from industrial processes or building operations, and use for space and non-industrial-process water heating and cooling
- capitalized value of expenditures on related installation labour

Rate

- include in CCA class 43.1 at 30% (versus current rates of 4-20%), or in a separate class

MEASURE: 7. CCA Rate for Manufacturing and Processing Equipment

A sliding scale Capital Cost Allowance for energy-using equipment employed in manufacturing and processing, based on energy efficiency performance.

RATIONALE/GOALS

- to provide an adjusted tax advantage to M&P assets that accounts for their relative energy efficiency, and not encourage low efficiency equipment through existing favourable tax treatment of M&P equipment
- induce the implementation within industry of further energy efficiency alternatives

PRECEDENTS

- CGA class 43, in which a flat rate of 30% (on a declining balance) is currently set for M&P assets
- CCA class 43.1, including assets to capture waste energy, and requirement for specified cogeneration equipment to satisfy heat rate parameters

ISSUES/DESIGN CONSIDERATIONS

- need to differentiate clearly between pieces of equipment
- ease of measure definition and application depends on availability of energy performance standards
- need to minimize the potential for 'free riders' by selecting appropriate standards and rates
- desirable to select a sliding scale that makes the measure revenue neutral to government, and which can be revenue neutral to individual businesses depending on their response
- need to ensure other performance factors are not unduly affected by having too large a sliding scale

ELIGIBILITY

- all manufacturing and processing operations in Canada that have assets qualifying for class 43

DESIGN PARAMETERS

Qualifying Expenditures

- all energy-using manufacturing and processing equipment and related assets that currently qualify for class 43
- must claim a lower rate of deduction for sub-standard equipment or that only meets mandatory minimum standards, claim a middle rate for equipment that meets common standards for energy efficiency performance, and can qualify for the higher rate if the equipment exceeds standards by a given percentage (or other incremental measure)

Rate

- sliding scale, such as from 25-30-35%, based on energy efficiency performance

MEASURE: 8. Reduced Rate of Tax for Energy Efficient M&P

Require that Manufacturing and Processing (M&P) entities achieve a certain level of energy efficiency performance in order to qualify for an adjusted MPPD (Manufacturing and Processing Profits Deduction).

RATIONALE/GOALS

- encourage greater energy efficiency and reduced emissions on the part of industry on a voluntary basis, including contributing further to the voluntary Climate Challenge to reduce greenhouse gas emissions
- provide a relatively greater incentive and reward to entities that are more energy efficient
- enhance the competitiveness of Canadian manufacturing and processing entities

PRECEDENTS

- all qualifying M&P entities currently enjoy a reduction in the standard corporate tax rate of 7%
- corporate taxpayers that qualify as small businesses receive a reduction in tax rate of 16%

ISSUES/DESIGN CONSIDERATIONS

- if businesses must qualify for the existing deduction, then there would be an immediate need to have all eligible taxpaying entities assessed for their energy efficiency performance at the outset
- a sliding scale may be appropriate, whereby entities qualify for varying tax reduction rates depending on thresholds of energy efficiency
- industries vary greatly in their energy intensity, so energy efficiency standards may be required for various industry categories
- various standards are available for various pieces of equipment and processes, but there is not yet one complete and consistent set of energy efficiency standards that would cover all M&P activities
- businesses that rent their premises do not have as much control over energy costs
- it may be appropriate to have the rate reduction be incremental over the existing rate, whether on a sliding scale or at a fixed amount, so that businesses may strive to qualify for this benefit, but do not have to requalify for the existing blanket rate reduction
- a phased in rate reduction may be appropriate, which is higher in the early years and gradually decreases on a schedule, as the energy performance across industry improves
- consider reducing the existing blanket rate reduction from 7 to 5%, and immediately having a 2% incremental component for those who already have sufficient energy performance, or allowing an additional 1% above the existing 7% for excellent energy performers
- consider an incremental portion of the reduced rate for companies engaged (e.g. greater than 50% of their business) in producing energy efficiency and renewable energy products

ELIGIBILITY

- all M&P facilities in Canada that currently qualify for the MPPD
- note: this would include producers of energy efficiency products and technologies

DESIGN PARAMETERS

Qualifying Expenditures

- applies to all taxable income from M&P, as per the existing application of the 7% reduced rate of tax

Rate

- provide an increment of 2% of tax rate reduction linked to energy efficiency performance
- reduce this to 1% and eventually phase out the measure

MEASURE: 9. Deductibility of Business Energy Operating Costs

Businesses must qualify for 100% deductibility of energy operating costs based on energy performance; a reduced portion would be deductible for low-efficiency operators.

RATIONALE/GOALS

- encourage good energy management in terms of investment in capital assets, and maintenance and operations
- encourage better energy performance and reduced emissions, including greenhouse gases

PRECEDENTS

- business meals and entertainment expenses are 50% deductible, reduced from 80% in 1995

ISSUES/DESIGN CONSIDERATIONS

- so many factors come into play in determining a business's energy use, that it may be difficult to design a mechanism that is fair for all; the mix of end uses may have to be taken into consideration in determining efficiency levels to be met
- energy efficiency levels would need to be set for different industries; composite standards would need to be established based on the currently available basket of standards
- design and application of this measure to energy use by buildings may be more straightforward, in that the mix of end uses is similar between entities and energy performance standards are fairly well developed
- businesses that rent their premises have less control over energy costs
- consideration would have to be given to the fact that many renewable sources of energy have low fuel costs, and thus would not be able to take as much advantage of this measure as other fuels, predominantly non-renewables
- consideration could be given to a sliding scale of rates of deductibility, based on levels of energy efficiency performance, if this would not unduly complicate the measure and its application
- consideration could be given to continuing the 100% deductibility for all businesses, but allowing 110% for excellent energy performers

ELIGIBILITY

- all corporate taxpayers

DESIGN PARAMETERS

Qualifying Expenditures

- applies to energy operating costs, i.e. expenses associated with units of fuel, electricity or equivalent units of energy consumed
- does not apply to labour or non-fuel supplies component of energy operating costs
- does not apply to maintenance costs, e.g. for maintaining energy-using equipment

Rate

- a fixed rate of 80% of energy fuel costs may only be deducted if the taxpaying entity does not meet the energy performance standards
- 100% of fuel costs may be deducted, as is currently the case, by those who meet the standard

MEASURE: 10. CCA Rate for District Energy Capital Assets

A higher Capital Cost Allowance for non-generation assets used in district energy systems. [Note: electricity generation and cogeneration assets, from specified renewable and other sources, are already included in CCA class 43.1]

RATIONALE/GOALS

- to remove the disadvantage environmentally sustainable and energy efficient options face, in comparison with other energy options that receive better tax treatment
- to recognize the energy efficiency potential of district energy systems

PRECEDENTS

- heating equipment, including district energy, used to qualify for class 34 (class 43.1's predecessor)
- specified cogeneration equipment qualifies for CCA class 43.1
- cogeneration equipment qualifying for 43.1 must meet a minimum heat rate requirement

ISSUES/DESIGN CONSIDERATIONS

- need to address industrial, commercial, and residential, recognizing that CCA classes 43 and 43.1 concentrate on manufacturing and processing
- it may be desirable to afford preferential treatment within this measure for renewable source district heating such as biomass, over other forms of district heating
- need to ensure that district heating is the most appropriate and efficient approach to given applications, and is not being engaged in mainly for tax reasons
- need to ensure no overlap between this measure and components of other measures, should more than one measure be adopted

ELIGIBILITY

- industrial (manufacturing and processing) facilities in Canada
- commercially owned buildings in Canada, including business sites and rental apartments/houses
- taxpaying owners of district energy systems that serve any groups of buildings, including residential subdivisions and the MUSH (municipality, university, school and hospital) sector

DESIGN PARAMETERS

Qualifying Expenditures

- systems must pass a minimum heat rate requirement, that is appropriate for the application (whether industrial, commercial, or residential district heating)
- non-generation assets, such as district heating and cooling distribution piping, plant piping, heat exchange stations, high efficiency boilers, high efficiency chiller plants and thermal storage (cogeneration assets are already covered under class 43.1)
- capitalized value of labour to install

Rate

- include in CCA class 43.1 at 30% (versus the current 4% in class 1), or in a separate class

4. ASSESSMENT OF MEASURES

Assessment Criteria

The following criteria were used to assess selected measures.

Fair/Transparent

equitable	• extent to which the tax treatment of similar income, expenses and/or taxpayers is equitable
neutral	• extent to which the tax treatment is not the main reason for taxpayers' investment decisions; or • extent to which the tax treatment aims to promote neutrality by compensating for existing imbalances within the tax system or markets

Manageable

simple	• relative ease with which the measure may be administered, in terms of definitions, approvals etc.; • extent of "transactions' and associated costs
predictable	• ability to predict the cost to government of implementing the measure, and the potential economic and energy efficiency improvements/benefits; • based clear boundaries for qualification; • available standards; • projected uptake
adaptable	• ability of the measure to adapt to changing circumstances over time, such as technological advances, without having to undergo extensive review and revisions
enforceable	• capability of the measure to provide strong incentives for compliance, or self-policing; and • ease with which enforcement may be applied if necessary

Implementable

compatible	• degree of compatibility with the existing tax system and precedents, regulations and other policies; • ability to be implemented in the short term (fine tuning versus tax reform)
acceptable	• degree of acceptance of the measure within government and among a variety of stakeholders

standards	• extent of existing performance or prescriptive standards on which to base the measure, if applicable
<u>Results</u>	
targeted	• extent to which the measure addresses barriers and goals; • targets taxpayers at appropriate decision points; and • avoids inducing behaviour that would have occurred anyway (free riders) or is not the desired outcome
uptake	• probable degree of uptake of the measure, that translates into results in terms of increased investment in the desired areas etc.
environment	• impact on the environment in terms of reduced energy usage, emissions etc. that may be attributable to the measure
<u>Socio-Economic Impacts</u>	

financial	• the net financial impact on government from implementing the measure, given the:
	  • administrative costs and tax expenditure required, versus
	  • the tax revenues received and unemployment costs reduced from increased economic activity and related employment

employment	• impact of the measure on employment levels
sectoral	• shifts between sectors as a result of the measure
competitiveness	• possible effects on competitiveness within and between sectors, and domestically versus internationally

Assessment of Selected Measures

Given the scope of the study and preliminary nature of the discussion paper in the measure identification and development process, the assessment was done on a qualitative, directional basis. It is summarized for each measure, in terms of each of the above criteria, in the Measure Assessment tables on the following pages.

Measure Assessment: 1. Energy Audit Tax Credits

Fair/Transparent

equitable	• available to all taxpayers, who receive same amount of benefit relative to their investment, regardless of income • does not benefit those who took early action
neutral	• works to address tax disadvantage of energy efficiency investments • depending on the amount and terms, may induce investment mainly for tax reasons, if the credit is so high that this is the main reason the work is undertaken (knowing that side benefits will accrue from the information gained from the audit and resultant actions); therefore need to design measure to avoid this

Manageable

simple	• relatively simple to administer
predictable	• fairly predictable based on building stock and uptake on similar programs by other jurisdictions in the past
adaptable	• easily adaptable to changing technologies and standards
enforceable	• qualifying expenditures can be linked to specified procedures certified by professionals

Implementable

compatible	• compatible with existing tax system, although the trend is away from investment tax credits
acceptable	• measure would be welcome by homeowners, developers, businesses, environmental groups, ESCOs • fairly acceptable to government as long as overall expenditure is manageable
standards	• training exists for specialized energy auditors, but the existence of certification or standards varies by trade and jurisdiction

Results

targeted	• gets at the barrier of not proceeding with an energy audit to determine the potential for savings
uptake	• will vary depending on the rate and publicity, within a wide range due to the number of potential participants
environment	• the measure itself does not have an impact, but acts as a catalyst for a significant effect if improvements are undertaken

Socio-Economic Impacts

financial	• minimal government expenditure if designed at appropriate levels • tax costs likely offset by additional construction activity and associated GST and income taxes
employment	• employment in energy modeling and auditing, and suppliers of related software
sectoral	• increases in energy services and suppliers of energy efficient equipment and products, if the improvements are undertaken
competitiveness	• increased competitiveness due to lower operating costs, once the improvements are undertaken • once the improvements are undertaken, lower cost of living for homeowners, contributing to higher available income (with spin-off consumer spending benefits)

Measure Assessment: 2. Tax Credits for Energy Efficiency Investments

Fair/Transparent

equitable	• available to all taxpayers, who receive same amount of benefit relative to their investment, regardless of income • does not benefit those who took early action
neutral	• works to address tax disadvantage of energy efficiency investments • depending on the amount and terms, may induce investment mainly for tax reasons (as per measure 1, and is the case for any measure)

Manageable

simple	• may be difficult to specify what constitutes an energy efficiency investment and draw firm boundaries
predictable	• depends on the rate that is set and the level of standards
adaptable	• can adapt to changing technologies and standards; how easily depends on how the measure is structured
enforceable	• verification may be an issue, but qualifying investments can be linked to specified procedures certified by professionals

Implementable

compatible	• compatible with existing tax system, although the trend is away from investment tax credits
acceptable	• measure would be welcome by homeowners, developers, businesses, environmental groups, ESCOs • government may be reluctant due to the measure being an ITC, and due to the potential for financial exposure and precedent setting
standards	• standards exist for many pieces of equipment, but not all, and are set by different bodies • guidelines exist for professional certification, but not necessarily for installation procedures

Results

targeted	• gets at the barrier of lacking financing for the initial investment in energy efficiency • includes the residential sector, both builders & homeowners
uptake	• will vary depending on the rate and standards, within a wide range due to the number of potential participants
environment	• likely to have a significant effect if structured for high uptake

Socio-Economic Impacts

financial	• could be small or large initial cost to government, depending on the rate and standards • payback will be in the form of increased energy efficiency, savings, profits, and taxes
employment	• employment in energy service companies , suppliers of equipment, private and independent power producers using renewable sources
sectoral	• increase in sales by suppliers of energy efficient equipment and building components
competitiveness	• improved competitiveness from lower operating costs • improved competitiveness of energy using equipment and energy efficient techniques

Measure Assessment: 3. RRSP Loan for Energy Efficient Homes

Fair/Transparent

equitable	• all prospective homeowners are eligible • not available to taxpayers who do not have an RRSP or who cannot afford to purchase a home • same (maximum) amount of loan, regardless of income levels, price of home, or amount in RRSP
neutral	• would not change the decision to buy a home, but may enable and induce the purchase of a more energy efficient home

Manageable

simple	• fairly simple, as a piggyback measure with one ceiling amount of funds to be borrowed; simplicity will be contingent on the use of clearly defined energy efficiency standards or ratings
predictable	• fairly predictable, in terms of housing starts and purchases, and the uptake on the existing program
adaptable	• can adapt to changing standards over the years, by attaching to a given standard that is improved over time
enforceable	• can use the honour system, as with most tax measures, with the capability for spot-checks, follow-up and enforcement

Implementable

compatible	• compatible with existing tax system and "companion" measure
acceptable	• likely to be acceptable once standards are well-defined
standards	• are available but need refinement to make them complete and consistent, for objective use with clear boundaries

Results

targeted	• targets the residential sector, which is very important and yet limited in terms of appropriate tax tools (e.g. CCA doe not apply to non-rental residential market)
uptake	• could be quite high, depending on the number of people with this extra amount in their RRSP, and the number of homes that qualify
environment	• beneficial in terms of reducing energy loads, energy use, and emissions from the residential building sector

Socio-Economic Impacts

financial	• revenue neutral from the government's standpoint, because the initial funds come from tax-sheltered taxpayer savings and are completely reimbursed through the energy savings • increased activity in and spin-off from construction and retrofitting • more disposable income among owners of energy efficient homes, from energy savings once the initial investment has been recaptured
employment	• increased employment in trades and sub-sectors that have obtained the necessary skills for energy efficient construction; therefore, shifts to more highly skilled jobs within the building sector • increased employment in suppliers of energy efficient materials • increased employment in energy efficiency auditing
sectoral	• increased activity and specialization within the home builders subsector of the construction trades
competitiveness	• enhanced competitiveness among those who develop the skills and the products to meet increased demand for energy efficient housing • increased export and technology transfer potential

Measure Assessment: 4. CCA Rate for Energy Efficient Buildings

Fair/Transparent

equitable	• only taxpayers earning income from buildings can use this measure • differentiates some buildings from others
neutral	• works toward correcting differential tax treatment of energy options • helps to alleviate barrier to investment posed by all building components being at the 4% CCA rate of buildings, as compared to 100% and 30% CCA for supply-side investments by taxpayers

Manageable

simple	• simpler to administer than splitting components from buildings
predictable	• depends on the rate that is set and the level of standards • design measure to avoid 'floodgates' potential by assessing current energy efficiency status of building stock and carefully selecting appropriate rate of deduction
adaptable	• can adapt to changing technologies and allows for flexibility in energy efficient design and construction
enforceable	• enforceable by using a sample of building inspections to verify that they meet the standard or certification given

Implementable

compatible	• compatible with existing tax system, in terms of the type of measure and precedents
acceptable	• likely acceptable to government and stakeholders
standards	• standards, codes and criteria exist, some in draft form • existing standards could be adopted as the threshold, or a percentage above minimum standards could be specified • set standards fairly high to minimize free riders and encourage greater results for the investment made

Results

targeted	• targets the energy efficiency performance of buildings
uptake	• will vary depending on the rate and standards, wide range possible due to the number of buildings
environment	• could be very beneficial, as the measure is geared towards the energy efficiency performance of a building once all the operating components are combined

Socio-Economic Impacts

financial	• government's tax expenditure could be small or large, depending on the rate and standards • could be revenue neutral or positive to government, due to: tax revenues from reduced operating costs offsetting increased capital deductions, and due to growth of energy services and technology industries
employment	• energy efficiency investments have high employment potential, particularly in relation to capital-intensive energy supply options
sectoral	• increase in the energy auditing (performance testing), building construction and renovation sectors • increase in sales by suppliers of energy efficient equipment and building components
competitiveness	• improved commercial and industrial competitiveness from lower operating costs • potential for increased exports

Measure Assessment: 5. CCA Rate for Energy Efficiency Equipment

Fair/Transparent

equitable	• differentiates some equipment and building components from others • may achieve a better matching of specified assets' useful lives and associated write-off periods
neutral	• works to address the imbalance in the tax system between demand (efficiency and conservation) and supply options

Manageable

simple	• initially challenging to identify specific types of equipment and expenditures that qualify versus those that do not
predictable	• depends on the rate that is set and the level of standards
adaptable	• can keep abreast of energy efficiency improvements by attaching to equipment standards that will change over time • more difficult for this measure to adapt to changing technologies than the building-as-a-whole measure
enforceable	• can verify the purchase of equipment if required, but there may still be room for 'strategic behaviour'; may need to require proof of certified installation, to verify equipment is being used, and used appropriately

Implementable

compatible	• compatible with existing tax system, in terms of the type of measure and precedents
acceptable	• may not appeal to government due to the difficulties in setting boundaries, and the potentially high transaction costs • acceptability and support among stakeholders will depend on equipment selected, but higher CCA rates will be welcome
standards	• standards exist for many pieces of equipment, but not all, and are set by different bodies

Results

targeted	• targets the energy efficiency of equipment
uptake	• will vary depending on the rate and standards, within a wide range due to the number of potential participants
environment	• results may be very good, particularly if equipment /components are used optimally; if not, this may somewhat reduce the potential environmental benefit from this measure • risk exists that individual components may not be used, or used appropriately, or combined appropriately with other energy efficient mechanisms

Socio-Economic Impacts

financial	• net expenditure by government would vary depending on the rate and standards • tax expenditure may be offset by increase in taxes from increased manufacturing and equipment sales and installation activity, and higher taxable income (due to lower operating costs)
employment	• increased employment in sales and installation of products
sectoral	• increase in sales by suppliers of energy efficient equipment and building components
competitiveness	• improved competitiveness from lower operating costs

Measure Assessment: 6. CCA for Heating/Cooling from Renewable Energy

Fair/Transparent

equitable	• available to corporate taxpayers
neutral	• addresses the gap in the tax system for such assets, at least in the industrial/commercial setting • important to ensure decentralized and generally renewable/clean sources of energy receive at least equal treatment to centralized conventional sources

Manageable

simple	• fairly easily administered once initial parameters are set
predictable	• fairly predictable, due to known sectors , current use of such equipment, and average turnover periods
adaptable	• fairly adaptable to changing technologies, because the energy sources will remain relatively constant
enforceable	• similar degree of enforceability as other equipment qualifying for CCA classes such as 43.1

Implementable

compatible	• compatible with existing tax system, in terms of the type of measure and precedents
acceptable	• welcomed by participants, equipment suppliers, and progressive builders • may be acceptable to government at this time even though heating was previously removed from class 34 when it became class 43.1 (this was not because it should not qualify, but rather because it included non-industrial aspects that did not fit well within class 43 for M&P, and because some expenditures were disallowed to make room for others (while keeping the measure itself revenue-neutral)
standards	• standards exist for many pieces of equipment, but not all, and are set by different bodies

Results

targeted	• targets the gap in heating and cooling from renewable sources, and in the loss of residual energy as waste heat • important to set efficiency standards for the generating process, so that participants are not benefiting from generating residual energy through intentionally inefficient systems
uptake	• should be fairly good, depending on rate set, because the technology is available and tax rates pose a key barrier
environment	• results should be good in terms of reduced emissions from increased proportion of renewable source heating and cooling, and capture and reuse of residual energy (that may not be suitable for industrial processes)

Socio-Economic Impacts

financial	• impacts should be minimal to moderate; tax expenditure may be offset by increased tax revenues resulting from lower operating costs and increased activity in the related sectors
employment	• increases in the renewable sector, and related services
sectoral	• increase in sales by suppliers of equipment • supports commercialization of new and emerging technologies
competitiveness	• improved competitiveness from lower operating costs • improved competitiveness in the supply of this equipment

Measure Assessment: 7. CCA for Manufacturing and Processing

Fair/Transparent

equitable	• treats all manufacturing and processing taxpayers under same set of rules
neutral	• provides incentives/disincentives based on energy efficiency

Manageable

simple	• analogous to measure 5, in terms of potential difficulties drawing the line between qualifying assets
predictable	• predictability depends on the available data for energy performance of industrial equipment, and on the rates of deduction set
adaptable	• adaptable to changing standards if linked to these in terms of meeting or exceeding a given standard as it is upgraded over time
enforceable	• could be open to strategic behaviour on the part of corporate taxpayers, trying to gain a certain classification for their assets; measure design would need to guard against this

Implementable

compatible	• fits within existing CCA 43, but sliding scale concept would be new application
acceptable	• may not be welcome by administrators within government and industry due to added complexity; design needs to address these concerns • will be welcome by progressive industrial companies
standards	• exist for some equipment but not all • some industrial equipment can be highly specialized and customized, not easily lending itself to standardization

Results

targeted	• targets the gap in industry action on improving energy efficiency in a significant manner
uptake	• would have good uptake, depending on rate set
environment	• could have significant impact in terms of emissions reduction, if the uptake is good

Socio-Economic Impacts

financial	• should be designed to be revenue neutral to both government and companies, either right away or over time; increased profitability and taxable income once savings realized from efficiency gains
employment	• minor increases in energy performance rating ESCOs, and in upgrading of equipment
sectoral	• possible shifts in expenditures within companies and sectors
competitiveness	• improved due to lower operating costs

Measure Assessment: 8. Reduced Rate of Tax for Energy Efficient M&P

Fair/Transparent

equitable	• applies to all taxpaying M&P entities • rewards some over others based on energy efficiency performance • renters disadvantaged vis a vis owners of facilities, due to less control over energy efficiency and costs
neutral	• would serve to encourage energy efficiency behaviour, and may be the added incentive that would get companies involved

Manageable

simple	• depends on the nature of the standards and the methods of proving that these have been met, but would tend to be complex
predictable	• a range of possible uptake levels and financial implications for the government can be predicted
adaptable	• can adapt to changing standards in energy performance, although as with other measures, will lag behind performance improvements
enforceable	• can make use of the honour system based on proof of audited results and spot checks with enforcement as required

Implementable

compatible	• compatible with existing tax system and associated measure
acceptable	• acceptability on the part of business and on the part of government will depend on the starting level of the rate reduction, and how this relates to the existing blanket rate reduction • if businesses must qualify for the existing deduction, they will see this measure as eroding a privilege they already enjoy
standards	• standards are available but would need some work to bring to a consistent and comprehensive package

Results

targeted	• targets M&P, which is a very energy intensive sector of our economy, and on which Canada is counting to achieve its greenhouse gas reduction commitments
uptake	• could be quite high, depending on the levels of standards and rates
environment	• beneficial impacts could be substantial

Socio-Economic Impacts

financial	• can be designed to be revenue neutral to government and industry, at the outset and over time (adjustments may be needed, based on early experience, to keep on revenue neutral track) • eventually, businesses will be better off due to energy savings and will not need the rate incentive; tax revenues can also increase from increased profits as a result of reduced operating costs
employment	• increase in the ESCO sector • increase in the producers and suppliers of energy efficient equipment • may increase in M&P overall, beginning with energy efficiency leaders, as companies' operating costs are reduced
sectoral	• energy intensive industries with the most potential for energy efficiency gains stand to benefit most from this measure
competitiveness	• competitiveness should increase in both M&P, and in the sectors involved in producing energy efficiency equipment and services • potential for increased exports and transfer of technology and expertise

Measure Assessment: 9. Deductibility of Business Energy Operating Costs

Fair/Transparent

equitable	• applies to all corporate taxpayers • will affect different companies to varying degrees, based on the energy intensity of their industry, their fuel choice and its price, their energy performance, and their control over energy decisions
neutral	• businesses would change behaviour based on this tax measure

Manageable

simple	• could be quite complex, particularly for industrial applications
predictable	• businesses with a high energy cost would quickly move to ensure that they could maximize their deductions • could be fairly predictable, given good information on the energy performance levels of industries and their energy fuel costs
adaptable	• adaptable to changing standards of energy efficiency performance
enforceable	• use honour system and audit/enforce as necessary (and possible given budget constraints), as with most other tax measures

Implementable

compatible	• compatible with the existing system to the extent that it is a variation on the existing level of deductibility of an allowed expense item, and that a blanket reduced deductibility is applied to business meals and entertainment expenses • not fully compatible in that it differentiates based on performance
acceptable	• will only be acceptable to industry leaders in energy efficiency who would already qualify for 100% deductibility of expenses • may not be welcomed by government due to the possible administrative and application complexities; but the cost of these can be more than offset by the increased tax revenues
standards	• largely available in standardized format for buildings, less so for various aspects of industry

Results

targeted	• targets the energy use of business, which accounts for much of the energy use in the country
uptake	• could be very large
environment	• significant potential benefits in terms of reduced emissions, including greenhouse gases

Socio-Economic Impacts

financial	• would be a financial gain to the government from reduced deductions until all businesses make the standard, and then from increased profits as a result of lower operating costs • initial cost to businesses that do not qualify
employment	• increased employment in energy efficiency products and services • potential longer term increases in employment in businesses as operating costs are reduced; initial short term decreases are possible
sectoral	• energy intensive, inefficient sectors adversely impacted in short term
competitiveness	• over time, increased competitiveness for improved energy performers due to reduced energy costs • decreased competitiveness for businesses that don't qualify, as a result of the higher tax bill

Measure Assessment: 10. CCA for District Energy

Fair/Transparent

equitable	• available to private utilities and other energy system/building owners, but not crown corporations that are not taxable
neutral	• addresses the gap in the tax system for such assets

Manageable

simple	• fairly easily administered
predictable	• fairly predictable, as uptake is likely to be gradual
adaptable	• quite adaptable, because the nature of the assets will tend to remain the same
enforceable	• similar degree of enforceability as other equipment qualifying for CCA classes such as 43.1

Implementable

compatible	• compatible with existing tax system, in terms of the type of measure and precedents
acceptable	• welcomed by participants and equipment suppliers, who have a strong feeling of current inequitable treatment • may be acceptable to government, even though heating was removed from previous class 34 when it became class 43.1 (see discussion in above measure)
standards	• standards for equipment likely exist, as do standards of measurement such as heat rate

Results

targeted	• targets the lack of district energy applications, which can be very energy efficient and may be from renewable sources or residual (waste) heat
uptake	• should be fairly good, depending on rate set, but will be gradual based on new construction and energy supply reconfigurations
environment	• quite high potential for efficiency gains from 'economies of scale' and reduced emissions from using one central unit • widespread success in some European countries

Socio-Economic Impacts

financial	• impacts should be minimal to moderate; tax expenditure may be offset by increased tax revenues resulting from lower operating costs and new investments • expands energy-related economic development benefits from one or two regions with conventional energy supply concentrations, to all regions of Canada
employment	• increases in the district energy sub-sector, and related suppliers
sectoral	• increase in sales by suppliers of equipment
competitiveness	• improved competitiveness from lower operating costs • improved competitiveness from a wider more stable energy supply across the country

5. CONCLUSIONS AND RECOMMENDATIONS

Recommendations and Rationale

Most of the measures selected for detailed analysis appear promising; some are more implementable in the near term.

Residential

The residential sector is faced by a lack of awareness of the opportunities and value of energy efficiency. Home purchasers are faced with a significant burden of associated taxes and fees. Generally, home purchasers are having trouble assembling the required down payment, and are not focused on energy efficiency. For these reasons, and based on the assessment in this report, the following measures are recommended:

1. Energy audit tax credit (modeling component covers new homes and audits cover retrofits);
2. ITC for EE and HC/RE (CCA rates do not apply when the building is not for business purposes); and
3. RRSP loan for energy efficient homes (to go towards the purchase of the home, and possibly toward qualifying energy efficiency upgrades).

Standards would need to be developed for qualifying energy audits/auditors, specified for qualifying expenditures on energy efficiency and heating and cooling from renewable energy, and selected for qualifying energy efficient homes. Complementary non-tax measures include energy efficient mortgages and an energy efficiency retrofit revolving fund.

Business

For the purposes of this report, business has included commercial and industrial buildings, and rental residential buildings. This sector is faced with very low CCA rates for energy efficient assets that are components of building structures, or operating sub-systems of buildings. Also, non-generation energy efficiency equipment and heating and cooling assets (including those using renewable sources) are not included in CCA class 43.1 with its favourable rate of deduction. For these reasons, and based on the assessment in this report, the following measures are recommended:

4. CCA for buildings;
5. CCA for energy efficient equipment; and
6. CCA for HC/RE.

Existing energy efficiency standards need to be selected and built upon, to provide foundations for these measures. Complementary non-tax measures include:

- expanded C-2000 program;
- expanded builder training programs; and
- energy efficiency product and building labeling.

Industrial

Besides energy for buildings, the industrial sector is challenged to improve energy efficiency in manufacturing and processing. The reduced rates of tax and favourable CCA rates are not linked to energy efficiency performance, so there is no tax incentive to improve performance. All of energy operating (fuel and electricity) costs are deductible regardless of energy efficiency. Taking this and the assessment in the report into account, measure 7 is recommended: CCA for M&P equipment.

Existing standards for energy using equipment would need to be used and built upon, and gaps in those standards filled, in order to provide a foundation for this measure. Complementary non-tax measures include:

- industrial motor challenge; and
- comprehensive EE standards.

It was felt that measure 8 (reduced M&P tax rate based on EE performance) and measure 9 (deductibility of energy costs) may prove too complicated and unwieldy.

Producers

In this report, producers referred to those providing energy efficiency products and services, and included district energy providers. The former have products and services available, but the uptake is low due to barriers facing potential investors. District energy is faced with the tax barrier of a low CCA rate. In addition to measures 1 through 7, above, measure 10 is recommended: CCA for district energy.

Complementary non-tax measures, in addition to those cited above, include:

- green equipment procurement; and
- feebates for energy efficiency equipment.

It should be noted that measure 2 (ITC for EE and HC/RE expenditures) would be desirable for all sectors from the standpoint of achieving results. However, it was felt that a broad investment tax credit measure would not tend to be adopted at this time, even if the investment would be eventually recouped through increased savings, productivity, and earnings.

These measures are income tax measures that are implementable in the near term. They go part way to addressing barriers, and can achieve quite a lot of environmental and economic good for a relatively low investment, without major adjustments to the tax system. They can be designed to be revenue neutral, given that the appropriate rates of deduction/credit are applied, and given that operating savings will accrue to taxpayers (thus increasing their taxable income). The measures are likely to have significant positive employment impacts, because employment per dollar invested in energy efficiency tends to exceed that of supply (the latter being more capital-intensive) and because they will lead to incremental new manufacturing and construction activity.

Such measures attempt to rectify imbalances in the tax system and related policies. The sources of such imbalance include tax measures and subsidies directed toward conventional energy supply. The above measures do not address all the barriers, and should be looked at in the context of measures that are longer term, constitute ecological tax reform, and also non-tax measures. Important energy producing and using sectors that have not been the focus of this report include transportation, independent power producers and utilities, and non-taxpaying sectors: MUSH (municipalities, universities, schools, and hospitals) and Crown-owned utilities.

Measure Design Requirements

Key challenges in designing such measures in more detail will be to ensure that they have clear boundaries and do not require much government effort to administer, particularly not on a transaction-by-transaction basis. The measures need to be tailored to minimize free riders, inducing undesired behaviour, double counting, and so-called 'strategic behaviour' of taxpayers attempting to maneuver within the system to have their expenditures meet the stated qualifications. The level of deduction, tax rate reduction, or credit will play a significant role in encouraging or discouraging investments made solely for tax reasons. It should be noted that the criteria outlined in this report represent ideals; most existing tax measures would not meet them.

To design the actual measures, more work needs to go into identifying available and appropriate standards, gaining more input and support for measures, and conducting quantitative assessments of possible impacts. Finance Canada would have the responsibility for any detailed design and economic analysis of measures.

NRCan should have the compendium of standards for energy using equipment and structures completed in the fall of 1996. Finance Canada is planning consultations for later in 1996 on tax and non-tax options regarding energy efficiency. Both these departments are working together on consultations to produce a final list of expenditures eligible for the CRCE measure introduced in the 1996 Federal Budget.

The fall 1996 NRTEE workshop that will use this paper as a basis for discussion will be instrumental in clarifying the state of the debate and determining the level of support for various measures. After these consultations, players will need to work together to provide input to Finance Canada and recommendations to the Minister of Finance.

Promising Measures from List of Options

Other promising tax measures, described in Appendix J but not selected for detailed review, include:

- Canadian Development Expense component for CRCE/43.1;
- further relax the Specified Energy Property Rules; and
- include energy efficiency in Canadian Renewable and Conservation Expense.

This is not a comprehensive treatment of measures, but should help to focus future work towards developing a cohesive package of measures to address barriers.

APPENDIX A: RELATED PROCESSES

A number of recent and ongoing processes are directly related to this work. Some provide background and a foundation for further study; others are underway and are likely to feed into and make use of the study results and the workshop discussion.

Some of these papers and processes are:

- the 1994 Task Force on Economic Instruments and Disincentives to Sound Environmental Practices, and related work that established a framework for analysis of tax and other options;
- the Pembina Institute background paper on Fine Tuning Taxes for Energy Eco-Efficiency, for the NRTEE Greening of the Budget Workshop in 1995, which selected candidate tax measures and proposed adjustments;
- the NRTEE 1995 Greening of the Budget Workshop, in which tax adjustments were discussed and recommendations were subsequently made as input to the federal budget;
- the changes to tax measures introduced as part of the 1996 Federal Budget, which provide flow-through shares for renewable energy projects, and broaden the eligibility for accelerated deductions on renewable and conservation assets;
- the 1995/96 Natural Resources Canada (NRCan) Level Playing Field study, preliminary findings of which are that energy efficiency investments are significantly disadvantaged by the current tax system, compared to other forms of energy supply;
- the current NRCan study to produce a technical paper and conduct consultations on existing energy efficiency standards for energy using equipment and structures;
- NRCan and Finance Canada's current work to define, with stakeholder input, the expenditures that will qualify under the newly introduced Canadian Renewable and Conservation Expense (CRCE) tax measure; and
- Finance Canada's work, and upcoming consultations, looking into tax and non-tax policy directions regarding energy efficiency.

Closely related government commitments and actions include:

- Canada's commitment to stabilize net emissions of greenhouse gases at 1990 levels by the year 2000;
- the Climate Change Action Plan, which relies on voluntary actions by industry, as part of the climate challenge and registry, to achieve sufficient results; and
- federal government initiatives such as the Federal Buildings Initiative (FBI) and green energy procurement.

APPENDIX B: METHODOLOGY

The methodology for this study involved the steps outlined below:

1. Identify goals. Establish the general goals of provisions to improve the tax treatment of applicable energy efficiency and renewable energy investments.

2. Set Context. Any new tax provisions will be brought in within the existing tax system, regulatory structure, and fiscal regime. Identify key existing tax measures and other policy instruments, as well as relevant trends and changes being discussed.

3. Establish Selection Criteria. Establish criteria to use in selecting from a list of optional tax and non-tax measures, those tax measures that will be explored in this study.

4. Identify Options. Identify tax options from which to select measures for further analysis, and complementary or alternative non-tax options for context.

5. Conduct Interviews. Conduct telephone interviews with 15-20 individuals within: government, ENGOs, ESCOs, energy-using companies, energy producers' associations, builder associations and other. Gather feedback on optional measures, including workability and other ideas.

6. Establish Assessment Criteria. Establish criteria against which to assess optional tax measures.

7. Assess Options. Assess the selected measures in relation to the criteria established. Include a discussion of barriers, design considerations, and anticipated results and impacts.

8. Prepare Report. Prepare an outline for review by NRTEE staff. Write a draft report for circulation to independent commentator(s). Prepare the final report to be used as a discussion paper by participants in the fall Greening of the Budget Workshop.

9. Attend Workshop. Attend the Greening of the Budget workshop in order to present, discuss, and receive further comment on the issues and options put forth in the report.

10. Finalize Report. Make any final adjustments to the report, should the NRTEE choose to publish as a discussion paper under the authorship of the consultant.

APPENDIX C: INTERVIEWEES

Name	Organization (area of focus)
Bell, Warren	BC Ministry of Employment and Investment
Burpee, David	NRCan (CRCE)
Comeau, Louise	Sierra Club of Canada
Damecour, Richard	F.V.B. (district heating)
Dodds, Steven	Finance Canada (CRCE)
Edworthy, Jason	Nor'Wester Energy
Elliot, Neil	American Council for an Energy Efficient Economy
Foley, Dermot	BC Energy Coalition
Gallagher, Fred	CEED
Garten, Marvin	Alberta Power
Jackson, Ernie	Canadian District Energy Association, Cornwall Electric
Jordan, Barbara	Finance Canada (energy efficiency)
Kohrs, Bernard	TransAlta Utilities
Lambert, Gord	TransAlta Utilities
Larsson, Nils	NRCan (C2000)
Marty, Nick	NRCan (standards compendium)
McLeese, Rob	Access Capital
Odenbach Sutton, Phyllis	NRCan (Level Playing Field Study)
Passmore, Jeff	CanWEA, IPPSO, Passmore Associates
Shepherd, Jay	Shepherd, Grenville-Wood
Sloat, Bob	Canadian Home Builders Association
Toms, Bill	Finance Canada
Tyers, Brian	Optimum Energy
Wharton, Don	TransAlta Utilities
Yang, Bun Li	NRTEE
Zeni, James	Finance Canada

APPENDIX D: REFERENCES

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APPENDIX E - GLOSSARY OF ACRONYMS

ASHRAE	ASHRAE/IES Standard 90.1-1989
C-2000	Commercial - 2000
CANMET	Canada Centre for Mineral and Energy Technology
CCA	Capital Cost Allowance
CDE	Canadian Development Expense
CEE	Canadian Exploration Expense
CGA	Canadian Gas Association
CHBA	Canadian Home Builders Association
CHIP	Canadian Home Insulation Program
COSP	Canadian Oil Substitution Program
CRCE	Canadian Renewable and Conservation Expense
"CRCDE"	"Canadian Renewable and Conservation Development Expense"
CSA	Canadian Standards Association
DE	District Energy
EE	Energy Efficiency
EFR	Ecological Fiscal Reform
FBI	Federal Buildings Initiative
FTS	Flow Through Shares
GDC	Green Development Corporation
GST	Goods and Services Tax
HC/RE	Heating and Cooling from Renewable Energy
HERS	Home Energy Rating System
HVAC	Heating, Ventilation and Air Conditioning
ITC	Investment Tax Credit
M&P	Manufacturing and Processing
MPPD	Manufacturing & Processing Profits Deduction
NECB	National Energy Code for Buildings
NECH	National Energy Code for Homes
NRCan	Natural Resources Canada
NRTEE	National Round Table on the Environment and the Economy
PST	Provincial Sales Tax
PUITTA	Public Utilities Income Tax Transfer Act
PUSH	Promoting Use of Solar Heaters
R-2000	Residential - 2000
RE	Renewable Energy
RRAP	Residential Retrofit Assistance Program
RRSP	Registered Retirement Savings Plan
SEPR	Specified Energy Property Rules
SR&ED	Scientific Research and Experimental Development

APPENDIX F: ENERGY USE AND EFFICIENCY TRENDS

The following tables are drawn from information presented in the NRCan Energy Efficiency Trends document[5]. Figures represent 1994 data unless otherwise noted. The data below has been selected to show major components; refer to the source document for complete information, graphic presentation, and discussion.

Sector: Residential	% of total secondary energy use: 19%
energy use 1984-1994: increase in energy use: 1392 petajoules net average rate of annual increase: 1.5% implicit rate of annual decrease due to reduced energy intensity: 0.4%	
type of dwelling: single detached - 57.4% apartments - 30.6% note: almost 70% of dwellings = pre 1978	energy use by type: single detached - 65.5% apartments - 24.1%
fuel: natural gas - 47.3% electricity - 34.0% oil products - 11.8% other fuels - 6.9%	end use: space heating - 61.8% water heating - 22.0% appliances - 15.8%

Sector: Commercial	% of total secondary energy use: 13%
energy use 1984-1994: increase in energy use: 936 petajoules net average rate of annual increase: 1.3% implicit rate of annual decrease due to reduced energy intensity: 2.1%	
type of building: office - 25.7% retail - 23.6% school - 15.7%	energy use by type: office - 23.8% retail - 23.5% school - 15.5%
fuel: natural gas - 42.3% electricity - 43.3% oil products - 6.4% other fuels - 8.0%	end use: space heating - 55.3% lighting - 14.3% auxiliary motor - 12.0%

[5] Energy Efficiency Branch, Energy Efficiency Trends in Canada. Ottawa: Natural Resources Canada, 1996.

Sector: Industrial	% of total secondary energy use: 39%
energy use 1984-1994: increase in energy use: 2841 petajoules net average rate of annual increase: 1.5% implicit rate of annual decrease due to reduced energy intensity: 0.1%	
activity by sector: other manufacturing - 51.2% construction - 19.2% mining - 14.8% pulp & paper 6.1% petroleum refining 1.4% chemicals 1.7%	energy use by sector: other manufacturing - 17.6% construction - 1.2% mining - 13.9% pulp & paper 29.2% petroleum refining 10.9% chemicals 9.2%
fuel: natural gas - 33.8% electricity - 25.1% oil products - 18.3% other fuels - 17.0% coal, coke - 5.8% note: other fuels includes wood waste	end use: process and heat - 60-95% steam generation - 20-25% auxiliaries - 5-20% note: these ranges of numbers generalized from data provided. Steam generation for pulp & paper = 65%.

The NRCan Commercial Sector Study[6] rated the potential improvement in energy efficiency of a number of products. Potential improvement was defined as the relative difference between the efficiency of products currently in use and the efficiency of the best product available on the market. As of 1994, the products were rated as follows:

>30%
incandescent bulbs
standard fluorescents
mercury vapour lamps
absorption coolers

20-30%
office equipment
(computers, printers, photocopiers)

10-20%
heat pumps
air conditioners
commercial refrigeration
cooking appliances

5-10%
gas or oil fired water heaters
gas or oil fired heating devices
chillers
high efficiency fluorescents
blowers

<5%
electric heating devices (not heat pumps)
electric humidifiers
electric water heaters
water coolers
refrigerated display cases
halogen bulbs, compact fluorescents, metal halide & high-pressure sodium lamps

[6] Efficiency and Alternative Energy Branch, A Ranking of Commercial and Industrial Energy-Using Equipment. Ottawa: Natural Resources Canada, 1994.

APPENDIX G: ENERGY EFFICIENCY STANDARDS

ASHRAE

The ASHRAE/IES Standard 90.1-1989 is the most recent version of an energy efficiency standard that has and is being updated. (A revised 90.R is in the final stages of approval, which is written in building code language and demands higher energy performance than 90.1.) It has been mandated as the minimum energy efficiency level for all new buildings built in the U.S. commencing in 1994.

All buildings must meet specified basic requirements with respect to:

- building envelope
- electric power;
- lighting;
- HVAC systems/equipment;
- service water heating;
- other systems/equipment; and
- energy management.

Criteria are also provided for specific systems and components: prescriptive criteria for HVAC, service water heating systems, lighting and envelope, and performance criteria as well for the latter two.

BEPAC

The Building Performance Assessment Criteria, developed at the University of British Columbia, provides criteria and procedures for the environmental assessment of new and existing office buildings, including energy performance levels.

C-2000

The C-2000 Program for Advanced Commercial Buildings is an initiative to promote the adoption of advanced technologies and management techniques in commercial buildings through pilot projects, monitoring and information transfer. The program demands a high level of energy performance that is maintained over a long period.

Technical criteria that specify the performance requirements of C-2000 buildings include the energy efficiency of the building and its sub-systems. The C-2000 design must meet the basic requirements of ASHRAE/IES 90.1, plus additional C-2000 requirements. Building system requirements are specified for:

- building envelope and air barrier;
- fenestration, doors and windows;
- thermal generation, storage, recovery and transfer;
- ventilation systems;
- HVAC delivery systems; and
- lighting and appliances.

Overall performance requirements are specified.

Energy Efficiency Act

This federal legislation was proclaimed in 1993. The associated regulations prescribe minimum energy efficiency standards for various

classes of equipment and appliances, that must be met for products to be imported, or sold in interprovincial trade. The regulations continue to be updated to add products and increase standards.

Energy Efficiency Standards for Equipment

NRCan conducted studies in 1994 to identify existing standards, and to rank commercial and industrial equipment. The department is currently preparing a compendium of existing standards for energy using equipment and structures, expected to be complete in the fall of 1996.

The 1994 study revealed that CSA/CGA standards were available for:

- incandescent PAR lamps;
- gas fired boilers (CGA);
- central air conditioners;
- gas fired water heaters (CGA);
- package terminal and unitary air conditioners;
- package terminal and unitary heat pumps;
- centrigual, rotary and reciprocal chillers;
- oil fired boilers;
- oil fired water heaters;
- electric water heaters;
- central heat pumps;
- water/ground-to-air heat pumps; and
- ice machines.

At the time of the 1994 study, the following CSA/CGA standards were under development:

- conventional fluorescent tubes;
- incandescent lights;
- gas heaters;
- pumps;
- refrigerated display cases; and
- vending machines and water coolers.

At the time of the 1994 study, there were no regulations or standards for the following:

<u>industrial</u>

- blowers;
- boilers;
- crushers; and
- lighting.

<u>commercial</u>

- blowers;
- compressors;
- indirect water heaters;
- electric boilers;

- electric unit heaters;
- electric baseboard heaters;
- refrigeration systems;
- absorption coolers;
- computers and printers;
- photocopiers and fax machines;
- cooking appliances;
- metal halide lamps;
- halogen bulbs;
- high efficiency fluorescent tubes;
- mercury vapour lamps; and
- high pressure sodium lamps.

NECB, NECH — The National Energy Code for Buildings, and the National Energy Code for Homes are model codes that are in the draft final stages of development. They provide minimum prescriptive and performance energy standards for commercial and residential buildings, that take into account different regions and climates within Canada. In order to become a minimum regulated standard, they would need to be adopted into provincial building codes.

R-2000 — The R-2000 Home Program, managed by NRCan and delivered in partnership with the CHBA, has the goal of improving the energy efficiency of housing without compromising the environment. Homes may be certified as R-2000 is they meet the technical requirements, which are provided in the areas of:

- building envelope;
- ventilation systems and equipment;
- combustion equipment;
- lights and appliances;
- indoor air quality; and
- environmental features.

Energy consumption/performance targets are calculated for R-2000 homes.

APPENDIX H: EXISTING TAX PROVISIONS

Assets involved in harnessing, distributing, and using energy are assigned to the following Capital Cost Allowance (CCA) classes (with the associated annual percent deduction on the declining balance shown in parentheses):

- class 1 (4%) - buildings and components, including electric wiring, lighting fixtures, plumbing, heating equipment, and cooling systems;
- class 8 (20%) - property not included in any other class, including appliances (e.g. refrigerators), fixtures, and machinery and equipment not used in manufacturing and processing;
- class 43 (30%) - equipment used in manufacturing and processing
- class 43.1 (30%) - alternative electricity generation equipment (such as photovoltaics, wind), fossil fuel based cogeneration equipment (meeting a heat rate requirement), equipment to reuse residual energy (waste heat) in an industrial process, and equipment used to collect landfill or digester gas. [Note: CCA class 43.1's predecessor, CCA class 34, used to include heating and district heating]; and
- class 41 and 41a (25% and 100%) - mining assets (including oil sands), and assets for new mines or major (greater than 25%) expansions.

Other relevant measures pertaining to oil and gas and mining are as follows:

- CEE (100%) - Canadian Exploration Expense, for pre-development expenditures, that can be carried forward indefinitely to match against revenues, and can be renounced to any investor in flow-through shares;
- CDE (30%) - Canadian Development Expense, for development expenditures, $1 million of which can be designated as CEE (receiving the 100% rate and flow-through capability); and
- Resource Allowance (25%) - percent of mining and oil and gas resource profits, deducted in lieu of provincial Crown royalties and mining taxes in computing income.

Changes implicit in the above tax measures that were introduced in the 1996 federal budget include:

- the Specified Energy Property Rules (SEPR) limiting eligible investors for class 43.1 were relaxed to include mining and manufacturing and processing;
- the Canadian Renewable and Conservation Expenditure measure was introduced to allow similar treatment as CEE for expenditures qualifying for 43.1. [Note: the list of qualifying expenditures, such as feasibility study costs, is currently being drafted by Finance Canada and NRCan - a background document is being circulated for comment];
- the CDE upgrade of $1 million to CEE was reduced from $2 million; and
- the Resource Allowance for oil and gas and mining was amended to place clearer limits on definitions of income and deduction, and ensure proper treatment and use of this measure.

It is useful to note that:

- while the new CRCE measure is analogous to CEE, the tax system still lacks a CDE equivalent measure for those who qualify for CRCE;
- investment in class 43.1 is still constrained by the Specified Energy Property Rules. (Flow through shares for oil and gas and mining are not constrained in this way.);
- a recent (June, 1996) change to CCA Class 43.1 is that only new equipment will be eligible for this class; used, reconditioned or remanufactured equipment will not be eligible. (The rationale for this was to ensure that the incentive provided by the tax system is targeted toward current energy efficiency technology.); and
- while the results of the NRCan Level Playing Field Study showed a range of "uplifts" offered various energy supply options, the Building Retrofit, Solar Wall and District Energy were the only ones that were disadvantaged vis a vis a neutral tax system.

Tax provisions relating to new home purchases include:

- a maximum of $20,000 that a taxpayer may borrow from his/her RRSP and apply to the purchase of a first home (paid back into the RRSP over 15 years, or claimed as income); and
- a pro-rated GST rebate on the purchase of new homes of 36% for homes with a fair market value of less than $350,000 down to nil for homes valued at greater than $450,000 (therefore the rebate amounts to a maximum of approximately 2.5% of the 7% GST).

A measure related to manufacturing and processing is as follows:

- corporations that derive over 10% of their gross revenues from manufacturing and processing in Canada are able to reduce the federal corporate tax rate of 38% by the Manufacturing and Processing Profits Deduction (MPPD) of 7%, to 31% applied to all profits not already receiving the 16% Small Business Deduction (SBD).

APPENDIX I: TAX MEASURES EXCLUDED FROM DETAILED ANALYSIS

The measures that were not selected are listed below under the main rationale for their exclusion.

The first group of measures are geared towards leveling the playing field between renewables and non-renewables in terms of tax treatment and the associated ability to attract investment. They were not selected for detailed analysis because they are general foundation measures, not as directly linked to the main topic of this paper. However, these measures are suitable for introduction, and complement the measures discussed in this paper.

- SEPR: further relax, or remove altogether, the Specified Energy Property Rules associated with CCA class 43.1 and CRCE. The SEPR used to limit the ability to obtain the deduction for class 43.1 ("renewable and conservation") assets to taxpayers whose principal business was energy, or who used greater than 50% of the energy produced for their business. The 1996/97 Federal Budget opened these rules to include mining and manufacturing/processing companies. This measure would see these rules being further relaxed (open to more categories of investors), or removed altogether (unrestricted access to/by all potential investors), to achieve the same tax treatment afforded to oil & gas and mining companies. This would significantly increase access to capital for new and emerging renewable energy companies.

- "CRCDE" (Canadian Renewable and Conservation Development Expense): complement CRCE with a CDE equivalent, and the ability to designate $1 million of CRCDE as CRCE. CRCE (Canadian Renewable and Conservation Expense), introduced in the 1996 federal budget, is analogous to the 100% CEE (Canadian Exploration Expense) afforded to oil & gas and mining. This measure would complement CRCE with a 30% CDE (Canadian Development Expense equivalent, and allow $1 million to be designated as CRCE. This would make the tax treatment analogous to existing measures for conventional energy.

- CRCE (and "CRCDE") for Energy Efficiency, District Energy, and/or Renewable Fuels: expand the eligibility for the Canadian Renewables and Conservation Expense (CRCE) to include energy efficiency, district energy, and renewable fuel applications. This would allow feasibility and other pre-development expenses to be flowed through and carried forward indefinitely, in order to be able to take advantage of the write-off. This would be analogous to the treatment now afforded to class 43.1 expenditures, which are predominantly renewable electricity generation.

Parts of this latter measure are within the scope of this study: energy efficiency and aspects of district energy (i.e. district energy from biomass, and in general as an energy efficient alternative). However, these measures are already being pursued and refined by a variety of parties following up on the 1996/97 Federal Budget announcements. A number of valuable recommendations are being input by stakeholders during the

current CRCE consultations, while eligible costs and the measure application is being defined.

The option of reducing or removing some or all of the following existing measures was not looked into in this paper. This is primarily due to the trend towards leveling the playing field by adding measures for alternative energy and energy efficiency, as opposed to taking away existing measures for conventional/non-renewable energy. This does not rule out the possibility of removing these and the complementary measures for alternative/renewable energy in the future.

> Hydrocarbon Measures: reduce or remove the CEE (Canadian Exploration Expense), CDE (Canadian Development Expense), and CCA class 41a for mining and oil sands expansions. These measures would be alternatives to adding measures such as the above for renewables, and would likely entail a removal of recently introduced measures for renewables such as the CRCE.

The next group of measures involve adjusting existing rates of tax and effecting rebates and credits. Some are more extensive than others, but it was felt that they would not tend to be accepted within the current tax policy climate.

> Reduced Rate for Energy Efficient Rental Properties: reduced rate of tax on income from rental properties that meet or exceed specified energy efficiency performance standards. This measure is geared to addressing the barrier that owners of rental properties are not induced to make energy efficiency investments if they are not incurring the operating costs themselves.
>
> GST Rebates on Products: temporary GST rebates on specified equipment for energy efficiency and heating and cooling from renewable sources. This measure would have potential, except the design of the GST has attempted to keep exceptions to a minimum.
>
> GST Rebates on Homes: increased GST rebates on the purchase of new energy efficient homes, and possibly on the labour component of qualifying energy efficiency retrofits. This measure has potential for consideration at a later date; it was decided not to focus on GST measures at this time due to the possibility of low acceptance within government.
>
> Carbon Tax: introduce a tax linked to the carbon content of fuels. This measure could have a significant effect, but requires greater acceptance among key stakeholders and the government.
>
> PUITTA: partial rebate of income taxes for private utilities (formerly provided for under the Public Utilities Income Tax Transfer Act), contingent on meeting certain DSM (demand side management) performance and percentage renewable energy generation. This measure could be very useful and restore some equity in tax treatment between private utilities and public utilities. However, PUITTA was just recently revoked, so some time would be required for acceptance and design of a renewed measure.

Renewable Energy Tax Credits: tax credits for investments in specified forms of renewable energy generation and related activities. Such measures have been introduced in the past in the U.S., such as for wind power. They can be effective, but are not generally in keeping with the current fiscal and political climate.

These options were not selected because they are municipal and provincial, not federal, tax measures:

Property Taxes: higher property taxes for less energy efficient buildings. This measure would afford more favourable municipal property tax treatment to energy efficient buildings.

PST Rebates: temporary Provincial Sales Tax Rebates on specified equipment for energy efficiency and heating and cooling from renewable sources. This measure would help to induce the purchase of energy efficient devices during a specified time period such as three years.

The following measure was not directly within the scope of this study:

Simplify SR&ED: simplify and streamline the Scientific Research and Experimental Development Tax Credit so that it is not so cumbersome to apply for and administer once approved. Small businesses in the renewables sector are not applying due to the complexity and cost involved in the process. Revisions to this existing measure could be worthwhile, but research and development was not within the focus of this study.

APPENDIX J: NON-TAX MEASURE DESCRIPTIONS

Program

expanded C-2000 program	The C-2000 program involves the energy efficient design and construction of commercial buildings. The number of pilot demonstration projects could be increased, focus placed on a component on developing standards, and the program could be extended to include retrofits.
green equipment procurement	Green equipment procurement would involve the government, and possibly industrial buying groups, purchasing energy efficient equipment in large quantities, in order to exert a 'market pull' on the marketplace.
builder training programs	These programs would train builders on energy efficient components and methods of construction and installation.
expanded Federal Buildings Initiative (FBI)	The FBI, a self-financing government initiative to improve the energy efficiency of federal buildings via retrofits, could be implemented more widely, thoroughly, and quickly.
energy modeling and audit software	Software with which to conduct design-phase energy modeling and post-construction/operation energy audits could be made more widely available by the government.
energy efficiency product & building labeling	Further product labeling could serve to differentiate pieces of equipment and components, and buildings, based on their energy performance.
information, education, demonstrations	A variety of initiatives have been implemented, and there are a host of other opportunities to disseminate information on energy efficient products, practices, and performance.
green energy procurement	The government is committed to green energy procurement, meaning the purchase of a minimum percent of total energy requirements from renewable sources. The commitment could be strengthened, and expanded beyond just electricity to include transportation fuels.

Financial/Economic

energy efficiency retrofit revolving fund	Energy efficiency retrofit revolving funds have been successfully implemented in other jurisdictions, whereby initial seed money is provided and future retrofits are funded by energy savings.
energy efficiency (EE) mortgages	Energy efficiency mortgages offer a reduced rate of interest for buildings that meet certain energy performance criteria, based

	on increased resale value and a higher likelihood of payment due to lower operating costs.
industrial motor challenge	Used in the U.S., such a program would challenge industry to develop the most efficient motor that meets other specifications; the winner fulfills orders placed by sponsoring purchasers.
green communities programs	These programs were being successfully implemented in Ontario until budget cuts; they involve housing retrofits and infrastructure improvements for greater energy efficiency and water conservation, and local employment.
feebates based on energy efficiency	Feebates have been applied to vehicles, whereby purchasers of lower energy efficient vehicles pay a fee that is rebated to purchasers of more energy efficient vehicles. This approach could be applied to a variety of energy consuming assets, including equipment and buildings (the latter in the form of an feebated electricity hook-up charge required of utilities).
emissions trading	Emissions trading allows emitters to collectively, rather than individually, reach emission targets by heavier emitters purchasing credits from those who have reduced emissions more than required.
infrastructure grants for EE, RE, and DE	There is a federal infrastructure program for the construction and upgrade of municipal and other infrastructure; some of these funds could be directed to energy efficiency, renewable energy, and/or district energy projects.
EE low-interest loans & guarantees	Low interest loans and guarantees have been used in various jurisdictions as mechanisms to encourage improvements in energy efficiency and other investments. The mechanisms eventually would be revenue neutral, as foregone interest is offset by energy savings and increased taxable income.
EE building code	The federal energy code for buildings is in a fairly complete draft stage, and contains the option of following prescriptive or performance based standards. The federal government could further encourage provinces to adopt the code as a minimum.

<u>Standards & Regulations</u>

EE equipment standards	Natural Resources Canada is developing a compendium of existing standards; this will enable identification of areas where standards are needed, or need strengthening and/or harmonization.
competitive	Electricity markets in North America are moving towards a more

electricity market rules and structure	competitive structure; the government can play a strong role in setting surrounding environmental regulations and targets for the proportions of renewable source energy, such as California's "Renewable Portfolio Standard"
emission discharge permits	Discharge permits enable the government to control and enforce the nature, amount and timing of emissions from fuel combustion.
emissions caps	Emission caps to control the total amount of emissions released.