User's Guide

P2/FINANCE
for Canadian Operations (B.C. Tax Defaults)

Version 1.0

Assessing the Business Case of Environmental Investments

Tellus Institute

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INSTALLATION

To install P2/FINANCE, insert Disk #1 and enter Windows. From the Program Manager or Start button, choose Run and type A:\setup (or B:\setup if the disk is in your B drive). When prompted, select a group name. After the installation, double click on the P2/FINANCE-BC icon to open the program.

GETTING STARTED

From the opening screen, you can access P2/FINANCE-BC's Help system, see an overview of performing a P2/FINANCE-BC analysis, open an existing Option, create a new one or exit the program.

To open a new Option, click on the *Create a New Option* button from this screen. A dialogue box will appear prompting you for a new name for the Option. Simply enter the name for your Option then click on the *Create* button. To reopen an Option you created previously, click on the *Open Existing Option* button and a list of existing Options will appear in a dialogue box. The software defaults to the most recently used directory. Select the Option you want to reopen then click on the *Open* button. Once you have chosen an Option to open or reopen, you are ready to begin the analysis.

ANALYSIS STEPS

P2/FINANCE-BC helps you make decisions about how to allocate your investment resources. It calculates the profitability of a potential investment by considering the cost of the investment and the revenues or operating cost savings generated by the investment.

For each Option you want to analyse, you step through the software's four main pages.

COST INVENTORY
: create an Option, define years of investment, and develop cost inventory

INVESTMENT COSTS
: enter data and tailor parameters for initial investment costs

OPERATING COSTS
: enter data for annual operating costs and cost savings

ANALYSIS
: generate analysis reports

HELP

P2/FINANCE-BC contains an extensive on-line help system, which comprises much of this Guide. You can access the general help screen and all help topics from the Help menu. You can also access screen-specific help for the current screen by pressing the F1 key.

Table of Contents

PREFACE

Welcome to P2/FINANCE for British Columbia Operations

Pollution Prevention
Financial Analysis and Cost Evaluation System

This User's Guide introduces the P2/FINANCE for Canadian Operations (B.C. Tax Defaults) software system (hereafter referred to as P2/FINANCE-BC), a tool designed to assist you in evaluating the profitability of pollution prevention options and other investments. The Guide offers step-by-step instructions for installing and using the P2/FINANCE-BC system. We recommend that you read this Guide while using the software.

P2/FINANCE-BC has been designed to be as user-friendly as possible. Users of other standard Windows™-based software should have little trouble understanding P2/FINANCE-BC's simple structure.

Organisation

Chapter 1 provides a general introduction to P2/FINANCE-BC and describes the computer specifications required for use of the software and installation procedures.

Chapter 2 discusses system administration tasks, such as defining system set-up parameters, managing your data files, accessing on-line help, and exiting the program. It also explains the terminology used throughout the program and prepares you for performing analyses with P2/FINANCE-BC by introducing some of the basic operations used throughout the software. It explains the function of various elements of the user interface and methods for accessing these elements. It also describes P2/FINANCE-BC's extensive on-line help system.

Chapter 3 describes the cost lists and how to develop a cost inventory.

Chapter 4 describes the process of entering investment cost data and their associated financial parameters.

Chapter 5 describes the process of entering operating cost data and their associated financial parameters.

™ Windows is a trademark of Microsoft Corporation.

Chapter 6 explains how to run an analysis and describes the various types of reports you can generate and how to interpret them.

Appendix A contains a case study performed with the software, which can be used as a step-by-step introduction to the software. Appendix B contains Canadian tax information relevant to the software. Appendix C describes Canada's Capital Cost Allowance.

Specifically for British Columbia

P2/FINANCE-BC was designed specifically for British Columbia but can be used by firms throughout Canada. P2/FINANCE-BC incorporates a generic but comprehensive list of costs and revenues that you can expand in order to tailor the software to your business's current and future operations.

Flexibility

P2/FINANCE-BC is a user-friendly program that allows you to tailor an analysis to the specific demands of the Option. This approach makes it easy to build on prior analyses and to perform sensitivity analyses.

On-Line Help

P2/FINANCE-BC contains an extensive on-line help system, which comprises much of this Guide. You can access the general help screen and all help topics from the Help menu. You can also access screen-specific help for the current screen by pressing the F1 key.

1. Introduction

Before you make a modification to your current process (e.g., switch to aqueous based solvents or purchase new equipment), you need to understand the financial impacts of this modification. P2/FINANCE-BC enhances your decision-making capabilities by drawing upon the principles of Total Cost Assessment (TCA), providing a comprehensive platform for assessing the profitability of a potential investment. Incorporating this information, together with less quantitative factors, including market and regulatory considerations, into the business case will improve the overall level of confidence about whether or not such an investment or change is appropriate.

Pollution Prevention (P2)

P2 refers to techniques that reduce pollutants at their source rather than controlling their release through end-of-pipe controls (known as the pollution control approach). For example, if you are attempting to minimise VOC emissions, P2 techniques could include implementing workplace practices that increase the efficiency of the use of VOC-containing materials or substituting VOC-containing materials with other materials to eliminate emissions. A pollution control approach, on the other hand, would apply technical controls to limit the release of VOCs into the atmosphere. P2 has several advantages:

- It may be more effective than pollution control at reducing the amount of pollution because it reduces opportunities for emissions;
- It reduces legal liability concerns because there are reduced opportunities for spills and accidents of chemical non-product output;
- It may reduce costs associated with the use of hazardous materials;
- It may enhance production efficiency, thereby decreasing costs; and
- It may allow firms to avoid many future regulatory requirements.

P2 Option

An Option in P2/FINANCE-BC represents an Option developed as part of the P2 planning process; an investment or process change you are considering, such as switching from high VOC solvents to low VOC solvents or investing in a new press or current practices. An Option is also used to characterise current operations (base case).

Total Cost Assessment (TCA)

Companies often think of P2 options and other investments as inherently costly and neglect to fully consider these investments' potential profitability through cost savings and increased revenues. TCA is an approach to removing potentially unwarranted and misleading financial barriers, ensuring that all potential investments compete on a level playing field. TCA typically differs from conventional practices in four key ways, because it:

- Expands the cost inventories, savings, and revenue structures to include indirect, less tangible items typically omitted from analyses of P2 Options;
- Emphasises the accurate allocation of costs and savings to specific process and product lines rather than lumping them as overhead costs;

- Extends the time horizon of the analysis to account for longer-term costs and savings typical of P2 options; and
- Uses profitability indicators capable of incorporating the time value of money and longer term costs and savings.

P2/FINANCE-BC incorporates all of the above TCA concepts by providing extensive cost inventories and emphasising the importance of allocation, a longer time horizon, and relevant profitability indicators.[1]

Analysis Structure

In a P2/FINANCE-BC analysis, you define cost and revenue data for a proposed investment and financial parameters. You can structure your analysis to assess the profitability of a single investment or compare multiple investments. By entering data for your current costs, you can compare these costs to the costs of a proposed investment. The multiple report choices include summary, tax deduction, cash flow, and profitability reports.

Level of Complexity

P2/FINANCE-BC provides a user-friendly structure for entering cost data and calculating profitability. For advanced analyses, P2/FINANCE-BC allows you to define variable operating costs and capital investments in multiple years.

1.1 Computer Specifications

Operating P2/FINANCE-BC requires an IBM compatible 386 with 8 MB of RAM and Windows 3.1 or Windows 95, and occupies 4 MB of disk space. However, a 486 computer with Windows 95 is recommended because P2/FINANCE-BC uses considerable system resources. If you experience difficulty operating the program, first close all other applications in Windows. If you still experience problems, use a system resources management program such as Hurricane, QEMM, or RAM Doubler.

1.2 Installation Procedure

To install P2/FINANCE, insert Disk #1 and enter Windows. From the Program Manager or Start button, choose Run and type A:\setup (or B:\setup if the disk is in your B drive). When prompted, select a group name. After the installation, double click on the P2/FINANCE-BC icon to open the program.

[1] For a more detailed explanation of TCA, see the British Columbia Ministry of Environment, Lands and Parks', *Total Cost Assessment Guidelines: Preparing the Business Case for Pollution Prevention Projects.*

2. Program Operations

2.1 General Overview

The P2 planning process, as developed for British Columbia businesses, involves a complete environmental review of a facility's operations, identification of improvement Opportunities, development of Options to operationalise the opportunities, and selection of Actions to implement the P2 plan. P2/FINANCE-BC facilitates a financial analysis of the Options generated in this process; Options represent changes to a facility's operational system that address a P2 Opportunity. Options include both a characterisation of current operations (base case) and of alternatives that you have developed. The financial analysis enabled by the software, in conjunction with technical, environmental, and other management criteria, can be used to prioritise Options.

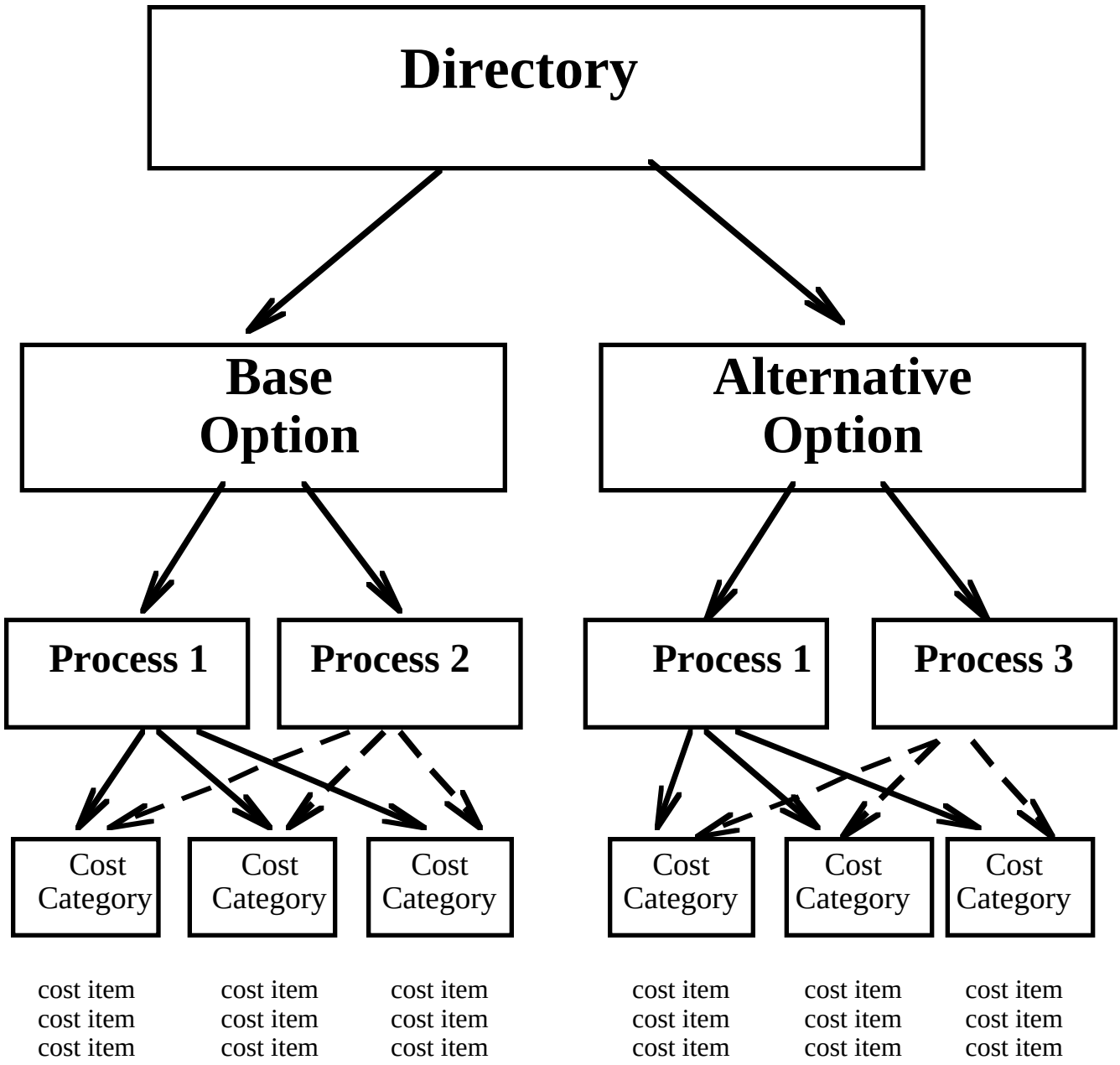
2.1.1 Program Structure

The flowchart on the following page represents the structure of P2/FINANCE-BC. **Directories** contain one or more related **Options** that are being compared with each other. For example, if there are three different wastewater reuse systems to choose from, there should be separate Options in one directory for each alternative, as well as a base case representing current practices if you want to make a comparison to "business as usual." All Options in this example need to be in the same directory because P2/FINANCE-BC can only compare Options within a directory; it cannot perform comparative analyses between Options in different directories. If a company is considering two separate investments—for instance, replacing a toxic material with a non-toxic alternative and installing a wastewater reuse system—each investment is represented as an Option and should be in its own directory.

Options should include all processes affected by an investment. A **process** is defined by you and represents a logical, discrete functional section of your operations. For example, a circuit board manufacturer might use 'Imaging,' 'Plating,' and 'Finishing' as processes. If a wastewater reuse system would affect all three processes, all should be included in that Option; if a different system would impact only the Plating process, then only that one process needs to be included. Two different Options (e.g., two wastewater reuse system alternatives) do not have to have the same number of processes for P2/FINANCE-BC to perform an incremental analysis of the Options.

The cost items in each process are grouped in **cost categories**, such as MATERIALS, BUILDINGS AND LAND, and LIABILITY. These categories contain cost items which may be relevant to one Option, but not another. For example, one wastewater reuse system may require new piping Materials be installed in the Imaging and Plating processes, whereas the alternative system does not require that any Materials be installed in either process. You do not need to choose the same cost items or cost categories in order to compare one Option to another.

Program Hierarchy



Since all processes have the same categories, P2/FINANCE-BC allows you to print some reports either by category or by process. In other words, you can list the cost items in one

of two ways. With *Process, then Category* selected, the report will list all of the categories and items within one process before listing any from the next process. For example, you will see all categories of Process 1 cost items listed, then all categories of Process 2

cost items. Conversely, with *Category, then Process* selected, the report will list cost items for every process under their respective categories (e.g., DIRECT MATERIALS cost items for Process 1, Process 2, etc.).

The boxes below demonstrate the two ordering choices, in this case for an Operating Cost Summary report.

Category, Then Process

OPERATING COST	Year 1
Direct Materials	
Process 1	
Raw Materials	1,000
Storage	250
Process 2	
Raw Materials	2,000
Storage	1,400
Process 3	
Solvents	1,000
Storage	250
Direct Labour	
Process 1	
Operating	750
Supervision	850
Process 2	
Operating	350
Supervision	650
Process 3	
Operating	450
Process 4	
Operating	750
Supervision	500
Utilities	
Process 1	
Refrigeration	200
Process 2	
Steam	800
Non-Product Output Management	
Process 1	
Disposal	1,500
Regulatory Compliance	
Process 1	
Recordkeeping	500
Process 2	
Permitting	200
Recordkeeping	400
Non-Deductible Taxes/Items	
Process 1	
Non-Deductible Reserves	1,000
TOTAL OPERATING COST	14,800

Process, Then Category

OPERATING COST	Year 1
Process 1	
Direct Materials	
Raw Materials	1,000
Storage	250
Direct Labour	
Operating	750
Supervision	850
Utilities	
Refrigeration	200
Non-Product Output Management	
Disposal	1,500
Regulatory Compliance	
Recordkeeping	500
Non-Deductible Taxes/Items	
Non-Deductible Reserves	1,000
Process 2	
Direct Materials	
Raw Materials	2,000
Storage	1,400
Direct Labour	
Operating	350
Supervision	650
Utilities	
Steam	800
Regulatory Compliance	
Permitting	200
Recordkeeping	400
Process 3	
Direct Materials	
Solvents	1,000
Storage	250
Direct Labour	
Operating	450
Process 4	
Direct Labour	
Operating	750
Supervision	500
TOTAL OPERATING COST	14,800

2.1.2 Analysis Steps

P2/FINANCE-BC helps you make decisions about how to allocate your investment resources. It calculates the profitability of an option by considering the cost of the investment and the revenues or operating cost savings generated by the investment.

Financial analysis is used to estimate the profitability of a potential capital investment. It includes two types of information: 1) cost and revenue data, and 2) financial parameters. The financial parameters include information on depreciation, inflation rates, escalation rates, income tax rates, and discount rates. (All of these parameters are discussed in more detail later in the Guide). The cost and revenue data include both one-time investment costs, referred to as capital costs, and ongoing operational costs and cost savings, referred to as operating costs.

Throughout the Guide "cost" is used to indicate both costs and cost savings, except where noted. Profitability is used throughout the Guide as a measure of the investment's performance, not as a formal accounting term.

A typical financial analysis run in P2/FINANCE-BC includes the following steps:

- *create an Option;*
- *define years of investment;*
- *develop cost inventory for initial investment and annual operating costs;*
- *define Option parameters;*
- *enter data and tailor parameters for initial investment costs;*
- *enter data for annual operating costs and cost savings; and*
- *generate analysis reports*.

Each step is described briefly below.

Create an Option

The first step in P2/FINANCE-BC is to conceptualise the analysis you want to perform. Are you considering expanding your current capacity? Are you considering a process modification? By answering these questions you can begin to define your analysis. Users should refer to the British Columbia Ministry of Environment, Lands and Parks' *Total Cost Assessment Guidelines: Preparing the Business Case for Pollution Prevention Projects* for a discussion on "Defining the Decision".

You also should consider the level of detail required for the analysis. Developing relevant cost data takes time. Therefore, to maximise your efficiency, begin by developing those costs and cost savings that you think are the most significant.

After consolidating the supporting information you need for the analysis, you are ready to enter the software and create an Option to represent your base case or alternative Option. (See Section 2.1 for a description of Options.) You give each Option a name so that P2/FINANCE-BC can organise the data. The name you choose for each Option helps you to organise all of the analyses you perform. If you want to compare a proposed modification to your current operations, you need to create two Options; one as the base

case Option to represent your current operations, and one as the alternative Option for the proposed change.

Determine Year of Investment

For each Option, you indicate when proposed investments, if any, will be made. P2/FINANCE-BC allows you to select the year or years (current year = Year 0) in which the investment will be made. P2/FINANCE-BC uses Year 0 as a default. For most Options, therefore, you do not need to define additional investment years. You do have to define additional years for complex Options with delayed or multi-year investments.

Develop Cost Inventory

The next step is to go through the items on the inventory list for the process(es) impacted by the Option and select those items that are relevant. Because P2/FINANCE-BC organises your operations by process (Processes 1 - 4), you first need to consider the processes to include in your analysis. Determining the processes relevant to the analysis is not always straightforward; thus, consider the possibility of impacts on all processes when you make a process modification. Simple process flow diagrams of (a) the current and (b) the alternative Option are helpful. Sometimes secondary effects are as significant as, or even more significant than, direct primary effects.

Define Option Parameters

Once you have developed your cost inventory, you need to define the financial parameters for the Option. These parameters are important elements of the financial analysis as they establish methods of depreciation, rates of taxation and inflation, and the lifetime of the Option.

Enter Initial Investment Cost Data

Input the relevant capital costs associated with the inventory items you have selected. For the conventional investment costs (e.g., equipment, construction), you most likely have a fairly complete data set in terms of equipment costs, contractor price quotes, and your own evaluation of direct labour and materials requirements. The remaining costs may be less clear and may require some investigation or estimation.

Enter Annual Operating Cost Data

Defining operating costs (e.g., start-up training, permitting), like the process of entering investment cost data, is one of the more challenging parts of performing a complete and accurate financial analysis. Many of the cost items you selected for the inventory may be items that have not previously been measured and/or items for which good data are not easily assembled. It is important to make the effort to include any significant costs and cost savings here. If you are confident that the costs of certain items in the inventory are not very significant and estimating them will entail substantial effort, you may want to omit them. However, when actual data cannot be readily compiled but you have some insight into the nature of the cost item, try to estimate the cost. It is generally preferable to have an imperfect estimation than to have none at all. In the end, you will have to make the trade-off between the quality of the data you enter (and its resultant benefit to you) and the effort required to collect it (the cost to you).

In addition to entering the annual costs and cost savings, you can enter an *escalation percentage* for a specific cost item if you expect the cost of that item to rise at a rate different from the *inflation rate* used for all of the items in the Option. (The Option inflation rate you specify applies to both Investment and Operating costs.) Alternately, if you know precisely how operating costs and cost savings will change in future years, you can enter the future values directly.

Generate Reports

Once you have all of the financial parameters and the cost data entered, you proceed to the analysis section where you establish the parameters for the Option. At this point you determine the economic duration of the Option and the discount rate to be used for the analysis. Now you are ready to generate one or more analysis reports.

P2/FINANCE-BC offers several report choices. You can evaluate the profitability of a single analysis, you can compare the profitability of two Options in an incremental analysis, or, you can compare the profitability of multiple alternative Options against a single reference Option. You can generate:

- summary reports to review the contents of an analysis;
- tax deduction reports to view the tax effects of your Option;
- cash flow reports to calculate the discounted cash flows; and
- profitability reports to calculate profitability indicators for the analysis, such as net present value, internal rate of return, and discounted payback.

Users should reference British Columbia's Ministry of Environment, Lands and Parks' *Total Cost Assessment Guidelines: Preparing the Business Case for Pollution Prevention Projects* for a more detailed discussion of analysing financial performance.

2.2 Software Operations

2.2.1 Moving Around in P2/FINANCE-BC

P2/FINANCE-BC assists the user in developing an analysis with its user-friendly screen interface. Movement through the software is accomplished with simple clicks of a mouse button, and data are entered through the keyboard or the on-screen calculator. Being familiar with the user interface and how to access the interface components is useful while you develop your analysis.

P2/FINANCE-BC's user interface is designed for ease of use and consistency. User interface elements and the colours of these elements indicate where user input is needed and the appropriate format for this input. A brief description of each tool and an example from the software follows. These tools are standard Windows tools that will be familiar to those users who have previously used Windows-based software.

There are places in the software where the text appears faded or dimmed. In these places, you cannot access these elements. You may need to select another item or move to a different page to access that command.

2.2.1.1 Page Tabs

P2/FINANCE-BC is laid out on four main pages. A tab, similar to a tab on a manila folder, appears at the top of each page is, that is labelled with the name of the page, or section of the program (as shown below). To move from page to page, simply single-

click the mouse on the tab of the page you want to move to. The new page will appear in place of the one previously visible, and the page label will appear in bold print, as **Cost Inventory** does in this example.

2.2.1.2 Pushbuttons

Pushbuttons in P2/FINANCE-BC, such as those pictured here, are used to initiate a function from the active page. In this example, these buttons could be used for the management of Option names. A single mouse click on a button with an ellipsis (. . .) opens a new screen that prompts you for more information or confirmation of the selected action. Clicking on the “New...” button asks you to enter a new Option name.

Buttons without an ellipsis carry out the command without further prompting (except for confirmation in some cases).

2.2.1.3 Radio Buttons

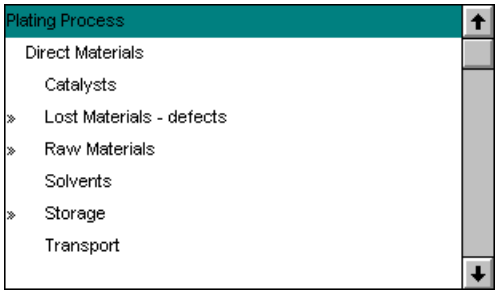
Radio buttons, which look like large circles, present an array of two or more choices. Like their namesake (radio stations), only one of these choices can be selected at any one time.

A radio button that has been chosen has a "•" in its centre.

2.2.1.4 Drop-Down Boxes

By clicking on the arrow on the right-hand side of a drop down box, you will open a list descriptive names of P2/FINANCE-BC elements. Drop-down boxes display the name of only one element at a time in the top window, with the remaining choices listed below. The element in the window is the active, or selected, item. To change the selected item, single-click the arrow button, move the cursor to the desired item, and release the mouse button. The new selection will appear in the box.

2.2.1.5 List Boxes



List boxes present a list of items; most list boxes allow the selection of several items at a time, though some list boxes allow for the selection of only one item at a time. A list box is similar in appearance to an opened list from a drop-down box. With this type of list box, when you select an item by double clicking on it, a chevron (») appears to the left of its name. The arrows on the right corners of the box can be used to scroll up and down the list. The box in the grey area shows the position of the visible portion of the list relative to the whole list. In this example, we are looking at the top of the list.

2.2.1.6 Check Boxes

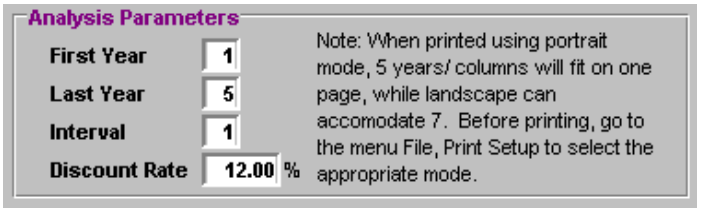
Selecting a check box toggles the chosen feature on or off. Check boxes are similar to radio buttons in appearance and function, but differ in that check boxes are not mutually exclusive. There is no limit to the number of check boxes in any particular array that can be turned on at one time.

2.2.1.7 Data Windows

In P2/FINANCE-BC, cost data are entered in fields located in data windows. Data entry fields appear with a white background. To move the cursor to a data box, either use the Tab key or use the mouse and click in the box. When in a box, if the field is blue, any typing will overwrite the previous entry. If the field is white and you see a blinking cursor, numbers you type will appear where the cursor is. The data you type will be accepted by the program when you press the Enter or Return key, the Tab key, or when you click elsewhere on the screen with the mouse.

	Cost ($)	Salvage ($)	Equipment Life	CCA
Plating Process				
Purchased Equipment				
Process Equipment	18,500	2,000	5	Class 24
Materials				
Structural	2,000	2,200	5	Class 43
Construction and Installation				
Downtime	5,000			Expensed
In-house Labour	150			Expensed
Old Equipment/Rubbish Disp	-1,200			Expensed
Start-up and Training				

2.2.1.8 Data Boxes



P2/FINANCE-BC parameter data are entered in data boxes. These boxes, also with a white background, display input that you type in from the keyboard or from the on-screen calculator. Like moving to data windows described above, to move the cursor to a data box, either use the Tab key or use the mouse

and click in the box. After typing, press Return/Enter, press Tab, or click the mouse button elsewhere on the screen to leave the data box.

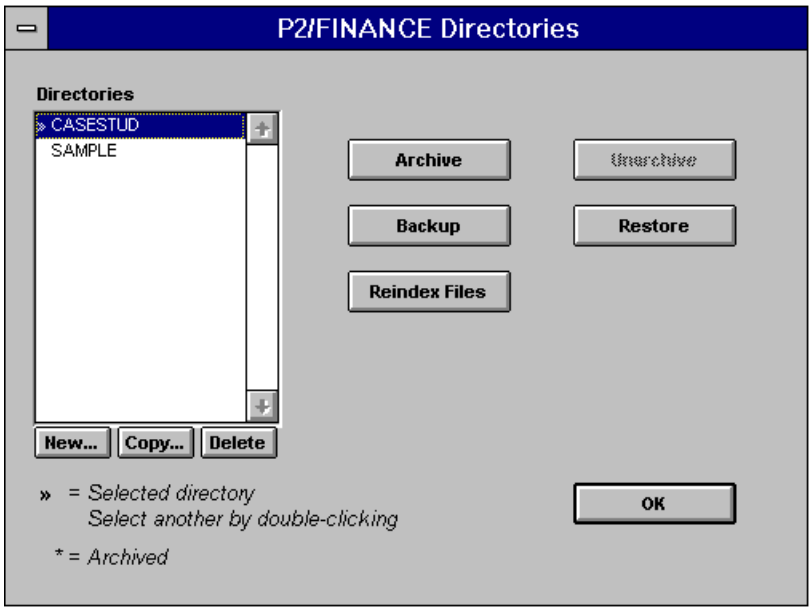
2.2.2 System Menu

The System Menu assists in administering P2/FINANCE-BC. It enables you to organise data from analyses of investment Options into different directories, to save your work, and to exit the software.

2.2.2.1 Directories

P2/FINANCE-BC allows you to organise data from analyses of P2 Options into different directories. Options within a directory share data files enabling you to run analyses to compare one Option to another in the same directory (see Section 6.1). You can establish multiple directories to organise Options that are not related to each other, i.e., that you will not want to compare in an incremental analysis.

When you select Directories from the *System* menu, your current directory (which is listed at the top of the screen in the blue banner next to the word P2/FINANCE) is temporarily closed, and the following screen appears. Before the directory is closed, P2/FINANCE-BC asks if you want to save changes if any were made. If you do not save changes, they will be lost when you reopen the directory.



The *Directories* list box lists (see Section 3.1 for descriptions of the Windows tools used by P2/FINANCE-BC) all of the directories that are available for storing Options. The first time you open this window, the default directory, SAMPLE, and the directory containing the case study data (see Appendix A) will be the only ones listed. The active directory is indicated by a chevron (»).

2.2.2.1.1 Creating, Copying, and Deleting Directories

To create a new directory:

1. Click on the *New...* button under the *Directories* list box.
2. A dialogue box will open prompting you for a name for the new Directory. Type in the name and click on the *Create* button.[2]

When you return to the P2/FINANCE Directories screen, you will see the new directory listed.

To make a copy of an existing directory:

1. Click on the *Copy...* button under the *Directories* list box.
2. A dialogue box will open prompting you to select which directory to copy from a pull-down menu and to define a name for the new directory. Make your selection, type in the new name, and click on the *Copy* button.

When you return to the P2/FINANCE Directories screen, you will see the new directory listed.

To delete an existing directory:

1. Select the directory you want to delete by highlighting it in the list box. You can highlight it with a single mouse click which will shade the directory name, as LP appears in the picture on the previous page.
2. Click on the *Delete* button under the Directories list box.
3. Two dialogue boxes will open asking you to confirm you want to permanently delete the selected directory. Click on the *Yes* button twice to delete the directory.

To rename a directory, first copy the directory to the new name, then delete the original directory.

When you return to the P2/FINANCE Directories screen, the deleted directory no longer appears in the list box.

2.2.2.1.2 Archiving and Unarchiving Directories

To create more disk space in your computer you may want to archive (temporarily place into storage) a particular directory. First, select the directory to be archived from the Directories list box. Then, click on the *Archive* button. P2/FINANCE-BC compresses all files in the selected directory into one file. At the same time, it deletes all uncompressed files. Archived directories are marked with an asterisk (*) in the Directories list box (as TEST appears in the picture on the previous page) and are unavailable for use in this form until they are unarchived.

To unarchive an archived directory, highlight the archived directory (marked by an asterisk) and click on the *Unarchive* button. P2/FINANCE-BC decompresses the files and restores them to a usable form.

2.2.2.1.3 Backing Up Directories

This function allows you to copy the data files from any directory to a remote floppy disk drive or another directory on your hard drive. Highlight the directory you wish to backup and

[2] The name can be up to eight characters long. Directory names are not case sensitive; cannot contain spaces, commas, backslashes, or periods; and cannot be identical to other directory names. Only the letters A through Z, numbers 0 through 9, and certain special characters [_ ^ $ ~ ! # % & - { } @ ` ‘ ( )] can be used.

click on the *Backup* button. P2/FINANCE-BC asks you to select a drive and directory for the backup. In backing up directory files to a floppy disk or other directory, P2/FINANCE-BC compresses the data files in the chosen directory into one file (identical to the procedure for archiving a directory) and then copies that file to a disk or specified directory. A popup box appears if there is not enough space to perform the task; in this case, P2/FINANCE-BC instructs the user to insert an additional disk in the drive or cancel the backup.

2.2.2.1.4 Restoring Directories

This function allows the user to restore a directory that was copied either to a floppy disk or your hard disk. If restoring from a floppy disk, insert the floppy disk into a remote floppy disk drive and click on the *Restore* button. P2/FINANCE-BC asks you for the directory name and location of floppy drive or hard drive directory. When complete, the copied directory appears in the Directories list box.

Note: Be careful when restoring directories from a floppy disk or your hard drive. If the directory still resides in P2/FINANCE-BC, the software overwrites the existing files with those stored on the floppy disk, unless you rename the existing directory.

2.2.2.1.5 Reindexing Files

P2/FINANCE-BC is programmed in the FoxPro database program. FoxPro uses database files (*.DBF) in association with one or more index files (*.CDX). The database files are repositories for data input by the user, whereas the index files serve to associate the data in ways that allow P2/FINANCE-BC to perform calculations. Reindexing files serves to make sure that all *.DBF files are associated with their appropriate *.CDX files.

The reindexing choice is only necessary if an unforeseen error has damaged the index files. In such a circumstance P2/FINANCE-BC instructs you to reindex your files. Under normal circumstances, you do not need to reindex files, though there is no harm in doing so.

2.2.2.2 Saving Your Work

Save in the System menu enables you to save any changes you have made to an Option or Options without exiting the software. You can thus save your work and continue editing. As with all software programs, it is recommended that you periodically save your work so that in the event of hardware problems (e.g., computer lock-up, power failure), you do not lose all of your work. P2/FINANCE-BC only enables *Save* if changes have been made since you entered the program or since you last saved.

2.2.2.3 Exiting P2/FINANCE-BC

To exit P2/FINANCE-BC, select *Exit* from the System menu. If you have made changes that have not been saved, P2/FINANCE-BC asks if you want to save these changes.

2.2.3 Edit Menu

The Edit menu contains standard Windows commands to facilitate simple data manipulation. P2/FINANCE-BC has choices to Undo (Ctrl+Z), Cut (Ctrl+X), Copy (Ctrl+C), and Paste (Ctrl+V).

2.2.4 Help Menu

2.2.4.1 Using Help

P2/FINANCE-BC contains an extensive on-line help system. You can access the general help screen and all help topics from the Help menu by selecting *Contents* or *Search for Help on...* You can also access screen-specific help for the current screen by selecting F1 while in that screen.

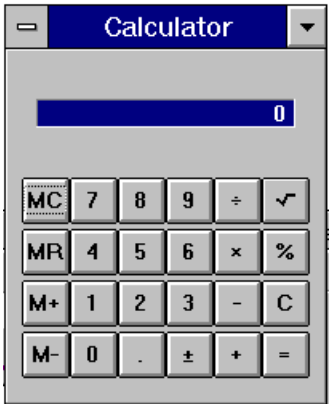
From the Help menu, a good way to look for information is to choose the *Search for Help on..* button. Search is like an automated book index, with hundreds of key words and cross-references. Follow the directions in the Search dialogue to find the information you need.

2.2.4.2 On-Line Calculator

P2/FINANCE-BC has an on-screen calculator that can be accessed from the Help menu. The calculator appears in a standard window that you can move, deactivate, and close.

2.2.4.2.1 Entering Numbers and Performing Calculations

Once the calculator is accessed, numbers can be entered from the keyboard using either the keyboard's number pad or the number line above the letter keys. Alternatively, numbers can be entered into t he calculator by clicking the desired numbers on the calculator with the mouse.



Any mathematical symbol on the calculator that can be typed on the keyboard, such as the "+" or "=" sign, can be activated by typing it or by clicking on the symbol with the mouse.

There are several different ways to perform mathematical and memory functions on the calculator, using either the keyboard or the mouse. Keyboard equivalents for some advanced calculator functions are shown and described below.

MC **Memory Clear**. Press this key once to clear a number stored in the memory.

MR **Memory Restore**. Press once to restore to the screen the number stored in memory.

M+ **Memory Add**. This key either stores a number in memory (if none is there) or adds the screen value to the number already in memory and saves the sum in memory.

M- **Memory Subtract**. This subtracts the screen value from the number stored in memory, saving the result in memory.

C **Clear**. Press once to erase current value and twice to erase current calculated value and operator.

Calculator Keyboard Equivalent Strokes

Keystroke	Equivalent
Q	√
R	MR
N	±
A	M+
Z	MC
S	M-
C	C

2.2.4.2.2 Entering Calculated Values from the Calculator

Once a value has been calculated it can be entered directly into a selected data field using cut and paste. To do this:

1. Perform the desired calculation.
2. Cut or copy the result using the Edit menu or the control keys.
3. Close the calculator or click on the P2/FINANCE-BC page to reactivate the software.
4. Highlight the cell in P2/FINANCE-BC where you want to paste the calculated value.
5. Paste the data from the Edit menu or by using CTRL-V.

The calculated value appears in the chosen data field.

2.2.4.2.3 Moving and Closing the Calculator

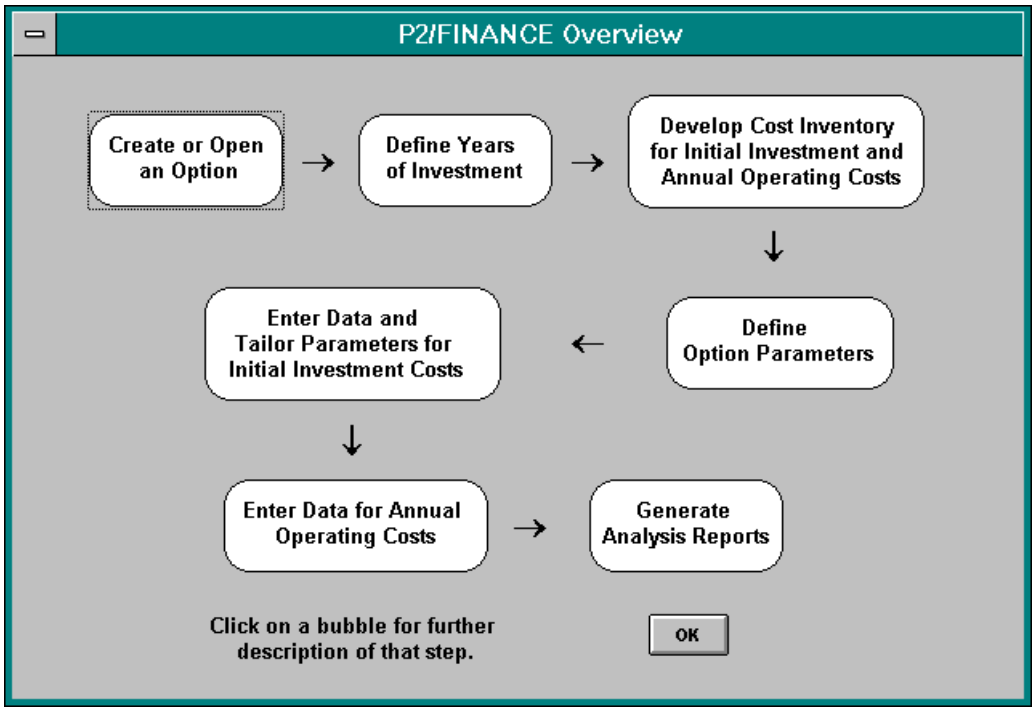
If the calculator window is blocking part of the P2/FINANCE-BC page that you want to see as you use the calculator, you can move the calculator window with the mouse.

1. Depress the mouse button on the blue bar running along the top of the calculator window (with the word 'Calculator' appearing on it).
2. With the mouse button still pressed, move the mouse to reposition the window. You will see an outline of the window move with the mouse.
3. When you have the outline of the window in place, release the mouse button.

To close the calculator, simply double click the box in the upper left-hand corner of the calculator window.

2.2.4.3 P2/FINANCE-BC Overview

Selecting *Overview* from the Help menu or the opening screen of the software opens the P2/FINANCE-BC Overview, a flowchart of the steps required for an analysis.



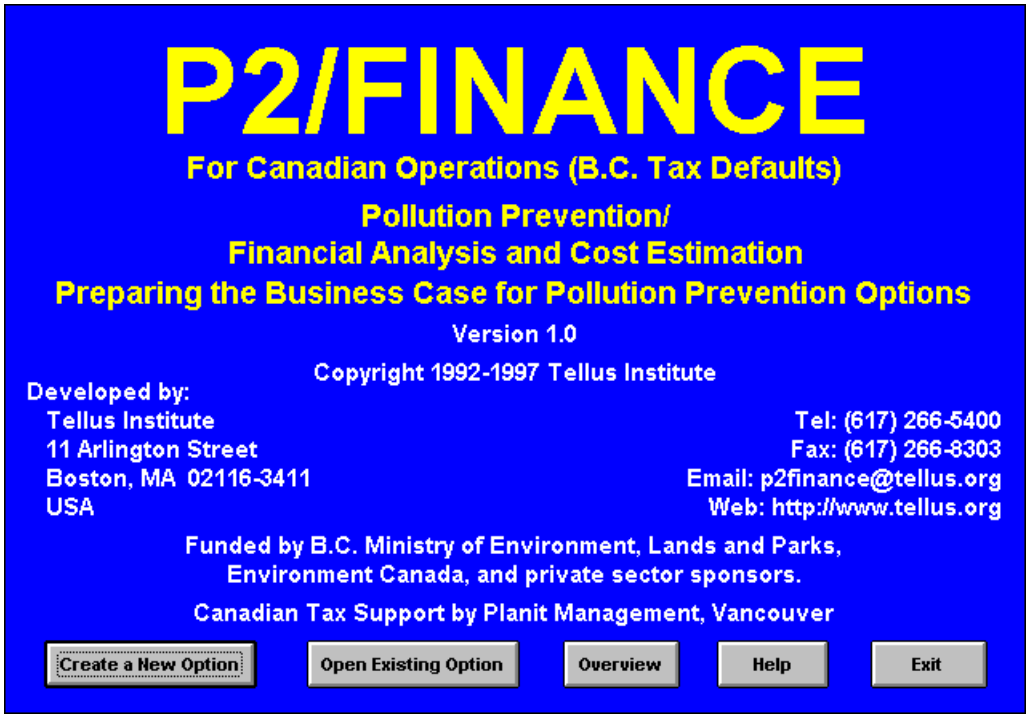
Clicking on any of the boxes provides further discussion on the steps required to use the software. See Section 0 for more discussion about the performing an analysis using P2/FINANCE-BC.

2.2.4.4 About P2/FINANCE-BC

By selecting About P2/FINANCE, you can see information about the version of the program you are running. You can also access technical information about your hardware and software.

2.3 Getting Started

To start P2/FINANCE-BC, double click on the **P2/FINANCE-BC** icon in the P2/FINANCE workgroup or whatever workgroup you selected during installation. At start-up, the software displays the Main Screen as shown below.



From the opening screen, you can access P2/FINANCE-BC's Help system (see Section 2.2.4), see an overview of performing a P2/FINANCE-BC analysis (see Section 2.2.4.3), open an existing Option, create a new one or exit the program (see Section 2.1 for a description of "Options" and their place in the P2 planning process).

To open a new Option, click on the *Create a New Option* button from this screen. A dialogue box will appear prompting you for a new name for the Option. (See Section 3.1.1 for more information about naming Options.) Simply enter the name for your Option then click on the *Create* button.

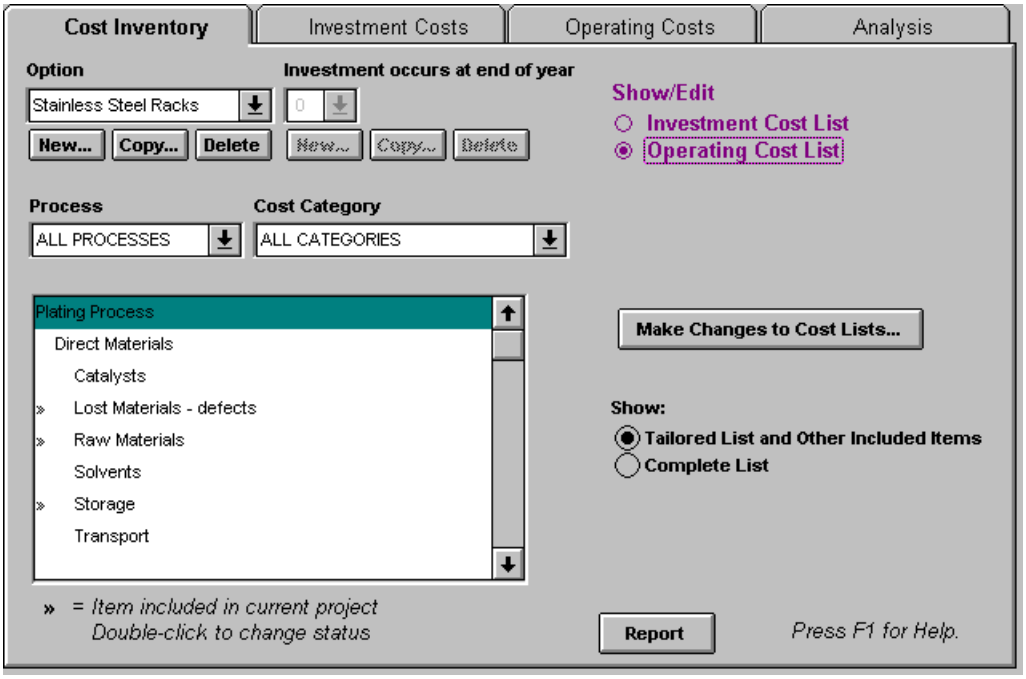
To reopen an Option you created previously, click on the *Open Existing Option* button and a list of existing Options will appear in a dialogue box. The software defaults to the most recently used directory. Select the Option you want to reopen then click on the *Open* button.

Once you have chosen an Option to open or reopen, you are ready to begin the analysis. Sections 3 through 6 step you through each of the main pages of the software.

3. Cost Inventory Development

The first of the four pages of the P2/FINANCE-BC program is the **Cost Inventory** page. From here you can create your Option and build an inventory of cost items that define the cost implications of the Option. In P2/FINANCE-BC, an Option can represent your current operations (base case) or an Option you have developed (alternative) as part of the P2 planning process (see Section 2.1). Users are encouraged to reference British Columbia's Ministry of Environment, Lands and Parks' *Total Cost Assessment Guidelines: Preparing the Business Case for Pollution Prevention Projects* for a more detailed discussion of "Defining the Decision."

Developing your cost inventory is a critical step in performing a TCA. The costs you include should be those that will be affected by the investment or process change. Creating a process flow diagram of your operations can be a useful way to organise your analysis by encouraging you to consider the scope of the Option; the inputs, outputs, and activities at each process stage; upstream or downstream impacts; and other indirect effects in areas such as quality, safety, liability, or corporate image.



3.1 Option Name

In addition to opening Options from the software's first screen (as discussed in Section 2.3), you can create a new Option or access an existing one from the **Cost Inventory** page. You can also copy or delete Options.

3.1.1 Creating a New Option

The first step in using the software is to establish a name for the Option(s) you want to analyse. When you create a new Option, all of the data you enter is saved under that Option name.

1. From the **Cost Inventory** page, under the *Option* drop-down box, click on the *New...* button to create a new Option. A dialogue box appears on your screen prompting you for a name for your Option.
2. Type in the name for the new Option. Option names are limited to 25 alphanumeric characters including spaces. Special characters, except single (‘) and double (“) quotes, can be used in your Option name.

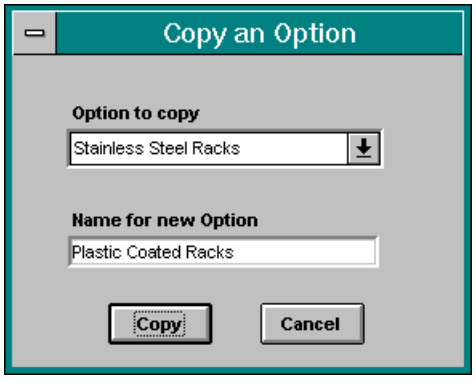
The name should be as descriptive as possible so that, in the future, when you go back to look for the Option, you will be able to easily recognise it.

3. Once you have entered the name, click on the *Create* button to close the dialogue box and return to the **Cost Inventory** page.

You will now see the name of your Option in the *Option* window, which means that it is now the active Option. As long as that Option is showing in the *Option* window (which is visible from all pages), any operations you perform – such as adding inventory items or entering data – occur within that Option.

3.1.2 Copying an Option

One of the main features of P2/FINANCE-BC is that it allows you to compare Options in terms of their financial attractiveness. You can compare your facility’s current operations to Options you developed during your P2 planing process, or you can compare different variations of an Option to each other. In many cases, you will find that a new Option you are considering and wish to analyse has some overlap – in terms of inventory items and costs – with Options you have already entered into the software. P2/FINANCE-BC allows you to copy previous Options that you can then modify as needed for your next analysis. This feature is useful at different stages of your analysis when you want to conduct sensitivity analyses for various cost items.



1. From the **Cost Inventory, Investment Costs,** or **Operating Costs** page, under the *Option* window, click on the *Copy...* button to copy the active Option. A dialogue box appears on your screen prompting you for the name of the Option to copy and a name for the new Option.
2. Type a name for the new Option using the guidelines mentioned above in the *Creating a New Option* section.
3. Click the *Copy* button to return to the page you were on.

The new copy of the Option you were working on will now be visible in the *Option* window and is therefore now the active Option.

3.1.3 Deleting an Option

Just as you can create a new Option, you can delete an existing Option.

You should only delete Options when you are sure you will not want to use them in the future. Remember that it may be easier to modify an Option you already created than to start a new one from scratch.

1. Make sure you have the Option you want to delete visible in the *Option* window.
2. From the **Cost Inventory, Investment Costs,** or **Operating Costs** page, under the *Option* window, click on the *Delete* button to delete the active Option. Two dialogue boxes successively appear on your screen asking you to confirm the deletion.
3. Click both *Yes* buttons to confirm and to return to the page you were on.

3.2 Investment Year

Most analyses target investments you are contemplating for the immediate future. P2/FINANCE-BC assumes that investments occur at the end of the year and that once the investment is made, operating costs and cost savings begin the following year. Thus, investment costs are incurred in year zero, and operating costs and cost savings begin in year one. When you start a new Option, it is assumed that any investments that are made are current and, therefore, will occur at the end of year zero.

You may find, however, that an investment has phases that will happen in different years. For example, you may purchase a new building at the end of year zero and a new machine at the end of year one. P2/FINANCE-BC provides the flexibility to allow you to use multiple investment years to account for one-time investment costs that happen throughout the lifetime of the Option.

3.2.1 Creating a New Investment Year

The default year for investments in P2/FINANCE-BC is year zero, i.e., if you do nothing with respect to investment year, your analysis proceeds as if all investments occur at the end of year zero. If you are considering a multi-year investment, you need to add the additional investment year(s) to the program.

1. To add a new investment year, click once on the *New...* button under the *Investment occurs at end of year* drop-down box on the **Cost Inventory** page. A dialogue box appears prompting you for the new year at the end of which your investment will occur.
2. Type in the new year and hit the Enter key twice or click *Create* once.

Remember: The year you choose will be the year before the operating cost changes take effect. If your investment is slated for two years from now, use two as the new investment year, and the operating costs will be entered starting in year 3.

You will now see the investment year you selected in the *Investment occurs at end of year* window, indicating that it is now the active year. As long as that year is active, any operations you perform – such as adding inventory items or entering data – occur in that year. To move between investment years, click once on the arrow next to the drop-down box. You will see the year(s) you have entered and zero. Click the mouse arrow on the year you want to be active, and it will then be displayed in the box.

3.2.2 Copying an Investment Year

For some multi-year Options, investments in different years may be similar to each other. For example, you may be replacing or converting your three solvent recovery stills one at a time over 3 years (due to cash flow constraints, or just to minimise disruption to your business). In this case, rather than creating two new investment years (end of year one and end of year two) and developing a similar cost inventory and entering similar cost data three times, P2/FINANCE-BC allows you to copy the inventory you have already built. In this instance, you can develop your cost inventory and enter the cost data just once. Then you can copy that information – both the cost items and the associated cost data – to the new investment years rather than retyping it.

Once you have built your inventory for the base Option year, you can copy that inventory to other years. If you want to copy the cost data too, you need to enter it first before copying the investment year. (See Section 4 for discussion about entering investment cost data.) When you copy the investment year, the cost data go along with the cost items.

1. From the **Cost Inventory** or **Investment Costs** page, under the *Investment occurs at the end of year* window, click on the *Copy...* button to copy the active Option year. A dialogue box appears on your screen prompting you for the year you want to copy from and the year you want to copy to.
2. Select the year you want to copy from (the base year where you already created an inventory) using the arrow next to the drop-down box.
3. Enter the new year.
4. Click the *Copy* button to return to the page you started on.

The new investment year is now visible in the *Investment occurs at end of year* window and is therefore now the active year. Any changes you now make in the investment inventory apply to that year only.

3.2.3 Deleting an Investment Year

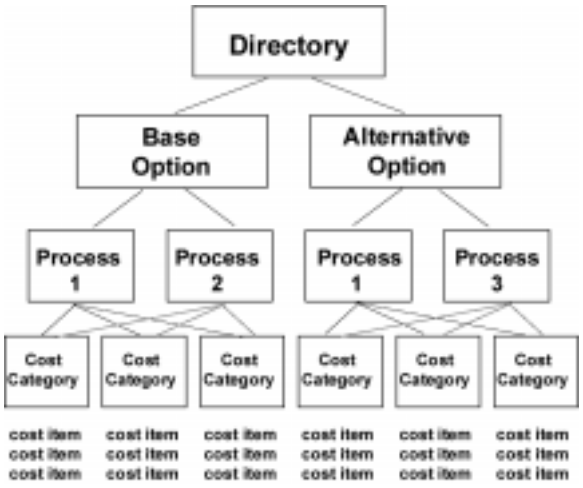
Just as you can create a new investment year, you can delete an existing one.

1. Make sure you have the year you want to delete visible in the *Investment occurs at the end of year* window.
2. From the **Cost Inventory** or **Investment Costs** page, under the *Investment occurs at the end of year* window, click on the *Delete* button to delete the active Option. Two dialogue boxes appear on your screen asking you to confirm the deletion.
3. Click both *Yes* buttons to confirm and to return to the page you were on.

3.3 Cost Inventories

Developing a complete and relevant cost inventory is one of the main elements of TCA. P2/FINANCE-BC assists you in this task by providing extensive detailed costs lists. Each process contains an investment cost list and an operating cost list from which you can develop your cost inventory.

The cost items that make up a cost inventory are organised into categories and processes that fit into P2/FINANCE-BC's structure as indicated in the diagram on the right and as discussed in Section 2.1.1.



3.3.1 Investment Costs

P2/FINANCE-BC is equipped with an extensive and detailed list of investment costs. Investment cost items for each of the processes are grouped into cost categories, such as BUILDINGS AND LAND and PURCHASED EQUIPMENT. Selection of the items to include in your analysis allows both ease of use and flexibility.

1. From the **Cost Inventory** page, select the *Investment Cost List* radio button.
2. Using the *Process* drop-down box, select the process for which you want to start building your inventory. Alternatively, you can keep it set to ALL PROCESSES whereby the cost items for all of the processes remain visible.
3. Using the *Cost Category* drop-down box, select the category you wish to start with. If you prefer, you can leave ALL CATEGORIES visible, but it may be simpler to select one category at a time to focus your thinking and to avoid having to scroll through the whole list. The list box in the lower right-hand corner of the page should now show the investment cost list for the process and cost category that you have selected.
4. With your mouse, position the cursor over each item you want to include in the inventory and double-click the mouse button. The cost items selected will be marked by a chevron (»). To remove a selected inventory item from your Option, simply double-click on it and the chevron will disappear.
5. Repeat steps 2 through 4 until you have a comprehensive investment cost inventory.

Remember: Even if you are only planning to make changes in one process, consider changes in other processes (secondary changes) that will need to be made to accompany the primary changes. These costs, which are often obscured during the development of a cost inventory, may be critical to the financial success of the Option.

If you are unsure as to whether to include an item from the list in your analysis, it is a good idea to include it initially. By doing so it will appear on your screen when you go to enter cost data. If you subsequently find that the item should be removed (e.g., because it is not relevant, a cost estimate cannot be made), it is easy to remove if from the list later.

3.3.1.1 Contingency Fund

This cost item captures moneys that are set aside to pay for unexpected costs associated with the Option. It is distinct from cost items such as working capital—an investment cost item which represents funds tied up in the investment that will be recovered at the end of the investment's lifetime—and liabilities—operating costs associated with legal actions taken against a business by outside parties.

3.3.2 Operating Costs

P2/FINANCE-BC is also equipped with an extensive and detailed list of operating costs and revenues. Operating cost items for each of the four processes are grouped into cost categories such as DIRECT MATERIALS and NON-PRODUCT OUTPUT MANAGEMENT and are selected using the same method as described for investment costs.

1. From the **Cost Inventory** page, select the *Operating Cost List* radio button.
2. Using the *Process* drop-down box, select the process from which you want to start building your inventory.
3. Using the *Cost Category* drop-down box, select the category you wish to start with. Again, if you prefer, you can leave ALL CATEGORIES visible. The list box in the lower right-hand corner of the page should now show the operating cost list for the process and cost category that you have selected.

With operating costs, it is likely that capital changes in one process will affect operating costs in many processes. Be as thorough as possible when you consider which process operating costs to include. Just as with capital costs, these costs may be non-trivial and therefore influence the results of the analysis.

You can now select the cost items you want to include by double-clicking each desired item. The cost items selected will be marked by a chevron (»). You can remove a selected inventory item from your Option by double-clicking on it.

The report (shown on page 28) is a good way to organise the data for the purposes of review and data collection because it prompts you to consider the relevance and significance of each item you selected. Since collecting cost inventory data requires effort, you will probably want to consider only those costs and cost savings that are both relevant and significant. Once you have built your inventory, you may find it helpful to generate a report (see Section 3.4).

3.3.2.1 Deductible Taxes and Non-Deductible Taxes

There are two Operating Cost categories that relate to taxes. These categories are meant for taxes (non-income) and other items that are handled separately from income tax in the program. The Deductible Tax category is for items such as British Columbia's Corporation Capital Tax (discussed in more detail in Appendix B), some property taxes, and some contributions to reserves. It should be noted that property taxes are generally deductible for income tax, but there may be cases where it is not. Similarly, some contributions to reserves (e.g., contributions for reclamation provided the company has established a detailed reclamation plan) are deductible for income tax, but others (contributions for contingent liabilities) are not. Cost items in this category will be treated like any other operating cost item, i.e., they will be subtracted (deducted) from revenue before income tax is calculated.

The Non-Deductible Taxes category is for items such as Canada's Large Corporation Tax (discussed in more detail in Appendix B) and other property taxes and contributions to reserves. Unlike other operating cost items, items in this category will be added back to income (not deducted from revenue) before income tax is calculated. This category appears on the income tax calculation section of the Cash Flow report.

3.3.3 Modifying Cost Lists

Although P2/FINANCE-BC comes equipped with an exhaustive list of cost items in its inventory, you may find that you have cost items or even whole categories for a specific Option that are not included in the software's inventory. You can make changes to the cost lists by clicking on the *Make Changes to Cost Lists* button from the **Cost Inventory** page. When you click on that button you open a new dialogue box from which you can make changes to the cost items or cost categories.

3.3.3.1 Processes

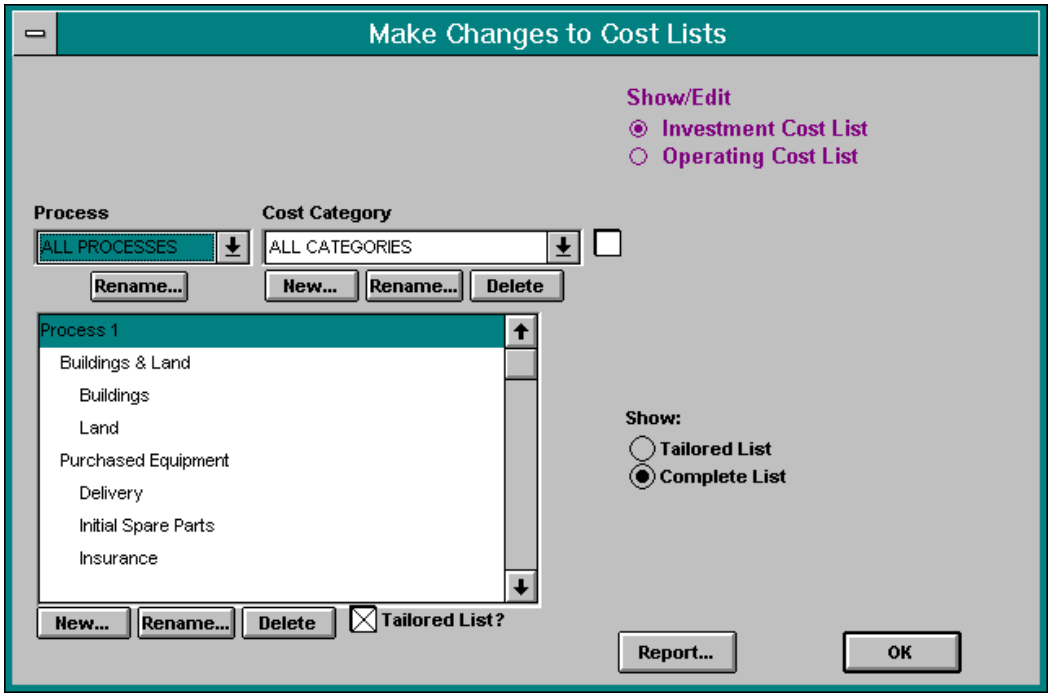
P2/FINANCE-BC comes pre-loaded with four processes generically named Process 1 through Process 4. You can rename these processes so they better describe your operations.

1. To rename a process, under the Process drop-down box, click on the *Rename...* button to bring up a dialogue box with a prompt for the new name.
2. Enter the new Process name, and then click *OK*.

The new process name is now visible in both the Process drop-down box and the list box.

3.3.3.2 Cost Items

The *Make Changes to Cost Lists* dialogue box shows a list box identical to the box on the **Cost Inventory** page. Below the box are buttons you can use to create, rename, and delete your own cost items.



1. To create a new cost item, you must first use the radio buttons to classify the item as a member of the operating cost list or investment cost list. Then you need to select the process and category in which you want the item to appear. To do this, you can either select a process and category from the *Process* and *Cost Category* drop-down boxes or simply highlight another cost item in the list box under the category and process where you want the new item to appear.
2. Click on the *New...* button to bring up a dialogue box that will prompt you for the name of the new item.
3. Enter the new cost item name, click on the *Tailored List* check box if you will use this item frequently in your analyses (see Section 3.3.3.4), and then click *OK*.

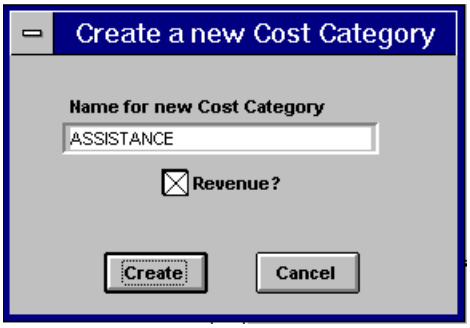
The new item you defined will now be visible in the list box (in alphabetical order). Renaming or deleting an item you previously added can be done in a similar manner using the *Rename...* and *Delete* buttons.

Please note that you cannot change or delete cost items originally included in the software, the Core List.

3.3.3.3 Cost Categories

Just as you can create new cost items, you can create whole categories in which new cost items can be placed. You may, for example, be considering an Option that would reduce your reliance on a service bureau. In this case, to capture the change, you could create an operating cost category called ASSISTANCE in which you could create cost items such as Service Bureau Fees. This category may offset some of your investment costs and better reflect the economic benefit of the Option.

1. To create a new category, first indicate where you want the category to appear by selecting either *Investment Cost List* or *Operating Cost List*.
2. Under the *Cost Category* drop-down box, click on the *New...* button to bring up a dialogue box with a prompt for the new name.
3. Enter the new cost category name, click on the *Revenue* check box if this category will contain revenues rather than costs, and then click *OK*.



The new category is now visible in both the Cost Category drop-down box and the list box. The category will be added to each of the four processes at the bottom of the Core List originally included in the software. Renaming or deleting a category you previously added can be done in a similar manner using the *Rename...* and *Delete* buttons.

Similar to the cost items, you cannot change or delete categories originally included in the software cannot be changed or deleted.

3.3.3.4 Complete vs. Tailored Lists

On both the **Cost Inventory** page and the *Make Changes to Cost Lists* dialogue box, you will notice radio buttons that allow you to select between viewing the *Tailored List* and the *Complete List*. This choice determines what items you will see in the list box **in addition to the Core List**. Please note that on the **Cost Inventory** page, the button is labelled *Tailored List and Other Included Items*.

The investment and operating Tailored Lists contain the cost items from the Core List plus any additional items you specifically add to the tailored list. Items you add to this list should be those that you expect will be relevant for many of the analyses you will perform. If there are items that you do not expect to use again, it is better to leave these items off of the Tailored List so that you do not have to wade through them each time you are building a cost inventory. All items that you add, regardless of whether you place them on the Tailored List, are placed on the Complete List. Thus, the Tailored List is a subset of the Complete List.

3.3.3.5 Cost List Reports

Recognising that each of the cost lists is quite long, you may find it helpful to have the complete list in front of you – either on the screen or on paper – before you begin to build your Option inventory. A copy of the Core List appears as Appendix B in this User's Guide. If you have tailored this list significantly, then you can display an up to date cost list. P2/FINANCE-BC enables you to view each list at any time from the *Make Changes to Cost Lists* dialogue box.

1. Click the *Report...* button which brings up a new dialogue box titled *Report Options*. You are now presented with three options.
2. Simply chose the options you want then click on the *Create Report* button to have the software generate the report.

You can list the costs in one of two ways using the *Order by:* radio buttons. With *Process, then Category* selected, the report will list all of the categories and items within one process before listing any from the next process. For example, you will see all categories of Process 1 costs listed, then all categories of Process 2 costs. Conversely, with *Category, then Process* selected, the report will list cost items for every process under their respective categories (e.g., DIRECT LABOUR costs for Process 1, for Process 2, etc.). For an example of these different types of ordering, please see the boxes on page 5. For a complete discussion of the organisation (Options, processes, categories, cost items, etc.) of P2/FINANCE-BC please see Section 2.1.

In the upper left-hand corner of the report screen the menu headings *File, Edit,* and *Text* appear, which allow you to print or save the report. See Section 6.3.2 for a full description of saving and printing reports.

3.4 Generating a Report

From the **Cost Inventory** page you can generate a report that shows the cost items you have selected to be on your operating or investment cost inventory for the active Option. By simply clicking on the *Report* button, a report like the one following will be generated.

The format of this report can assist you in developing your cost inventory. Once you have developed your comprehensive cost inventory, the report serves as a checklist, allowing you to indicate whether each cost item is relevant to your Option and significant from a cost perspective. The last column of the report assists data collection and subsequent data entry into P2/FINANCE-BC by providing a place for you to record collected cost data.

In the upper left-hand corner of the report screen the menu headings *File, Edit,* and *Text* appear, which allow you to print or save the report. See Section 6.3.2 for a full description of saving and printing reports.

Directory: CASESTUD 05/05/1997
Option: Plastic-Coated Racks Page 1

INVESTMENT COST INVENTORY

	Investment Years	Relevant?	Significant?	$
Plating Process				
Purchased Equipment				
Process Equipment	0			
Materials				
Structural	0			
Construction and Installation				
Downtime	0			
In-house Labour	0			
Old Equipment/Rubbish Disposal	0			
Start-up and Training				
Manufacturing Trials/Variances	0			
Contingency				
Contingency	0			

OPERATING COST INVENTORY

	Relevant?	Significant?	$/year
Plating Process			
Direct Materials			
Lost Materials - defects			
Raw Materials			
Storage			
Direct Labour			
Maintenance			
Operating			
Non-Product Output Management			
Disposal			
Regulatory Compliance			
Labelling			
Testing			
Non-Deductible Taxes/Items			
Non-Deductible Reserves			

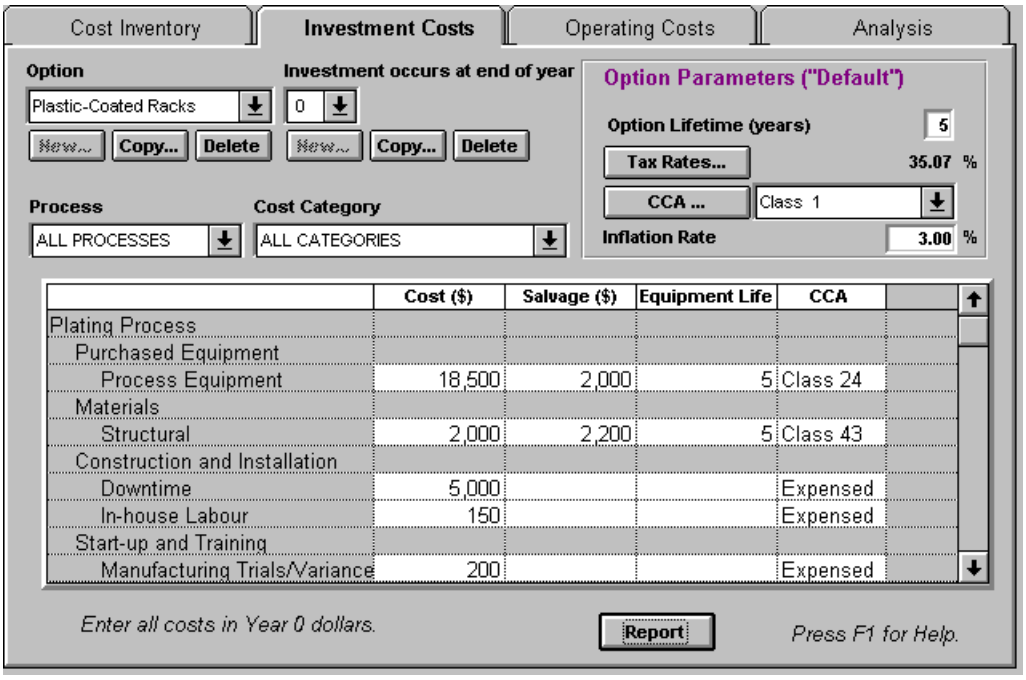
4. Investment Cost Data Entry

The quality of the data you gather and enter into the program ultimately governs the utility of the analysis. The more reliable and accurate the data, the better and more effective the output of the program. Remember, the purpose behind performing this type of analysis in the first place is to reflect the true costs and cost savings of an Option in order to assess its relative profitability. The use of cost data that are inaccurate can skew the analysis and paint a distorted picture of the financial viability of the Option.

It is therefore important to get the best possible price quotes from product and service vendors for all capital costs. In addition, as you go through your cost inventory, you want to be sure to use the best information available to estimate costs for which direct quotes are not available. If you have undertaken capital projects in the past, the costs they incurred may serve as good indicators of costs you can expect with a new project. If you do not have this information available, your local trade association may be able to provide data on which you can base your estimate.

With that said, there is a trade-off between the incremental benefit of increased accuracy and completeness and the associated cost of collecting cost data. Costs that you are fairly certain are small, even if you do not know their precise amount, may not be worth much effort. For each piece of data you collect, a quick mental calculation of the cost of your time versus the expected benefit in terms of analysis accuracy should be made. This analysis tool, like any other, should facilitate your decision making, not hamper your efforts. You have to be the final judge of how to best use your time. Please reference British Columbia's Ministry of Environment, Lands and Parks' *Total Cost Assessment Guidelines: Preparing the Business Case for Pollution Prevention Projects* for a more detailed discussion of identifying costs.

Investment cost data are entered on the second page of the program, **Investment Costs**, pictured above. The upper left portion of the box displays the same format and choices



you saw on the **Cost Inventory** page. It is included on this page as well so that you can see what part of what Option you are working on and can jump to different categories, processes, or Options without going back to the **Cost Inventory** page. The upper right portion of the page shows a small box wherein you will define the Option's financial parameters. The entire bottom portion of the page shows a data window where the actual cost data will be entered. These latter two portions are described in detail below.

All cost data entered in P2/FINANCE-BC are considered to be in year zero dollars. Because the software includes the effects of inflation in the analysis, this feature is important to be aware of and understand. For investment costs, this distinction becomes important if you have investment costs occurring in years other than year zero.

For example, if you are considering purchasing new wastewater treatment system, but you do not anticipate purchasing it for two years, you would create your cost inventory with an investment year set to two. The price quotes you get today for purchase and installation will be in today's (year zero) dollars. In two years, if you go to buy the equipment and pay for the installation, you might find the prices higher than the quote. The higher the economy's rate of inflation, the greater this difference. P2/FINANCE-BC automatically accounts for this difference by adjusting the data you enter. Therefore, all data must be entered in year zero dollars so that the proper adjustment is made.

Please note that the Option's inflation rate is the same for both Investment and Operating costs.

4.1 Option Name

Just as on the **Cost Inventory** page, you can copy or delete an Option from the **Investment Costs** page. You cannot create a new Option from this page because it would not have a cost inventory.

4.1.1 Copying an Option

P2/FINANCE-BC allows you to copy previous Options that you can then modify as needed for your next analysis. This feature is useful at different stages of your analysis when you want to conduct sensitivity analyses for various cost items. See Section 3.1.2 for specific instructions on how to copy an Option.

4.1.2 Deleting an Option

Just as you can create a new Option, you can delete an existing Option. See Section 3.1.3 for specific instructions on how to delete an Option.

4.2 Investment Year

Just as you can from the **Cost Inventory** page, you can copy or delete an investment year from the **Investment Costs** page. You cannot define a new year from this page because it would have no cost inventory.

See Section 3.2 for discussion of Investment Years.

4.2.1 Copying an Investment Year

For some multi-year Options, investments in different years may be similar to each other. P2/FINANCE-BC allows you to copy information – both the cost items and the cost data – to new investment years, rather than retyping it. See Section 3.2.2 for specific instructions on how to copy an investment year.

4.2.2 Deleting an Investment Year

See Section 3.2.3 for specific instructions on how to delete an investment year.

4.3 Option Parameters

To properly measure the profitability of an investment, you need to calculate the cash flows that will result from that investment. The calculation of cash flows requires the imposition of financial parameters that characterise the monetary aspects of your investment. Specifically, you need to consider how your investment will depreciate, what level of taxation you will be subject to, how your costs and cost savings will increase over time, and how the value of money will inflate over time.

P2/FINANCE-BC helps you define these parameters and then uses them to shape the analysis. In this way, you can tailor the analysis to your particular situation by using parameters relevant to your facility and the Option you want to analyse. For investment costs, you will want to consider Option lifetime, depreciation, taxes, and inflation as you enter the data to perform the analysis. (The Option lifetime, taxes, and inflation all apply to both Investment and Operating costs.)

4.3.1 Option Lifetime

The lifetime of the Option is composed of many variables such as the expected lifetime of the equipment and the number of years for which operating costs and cost savings are reasonably predictable.

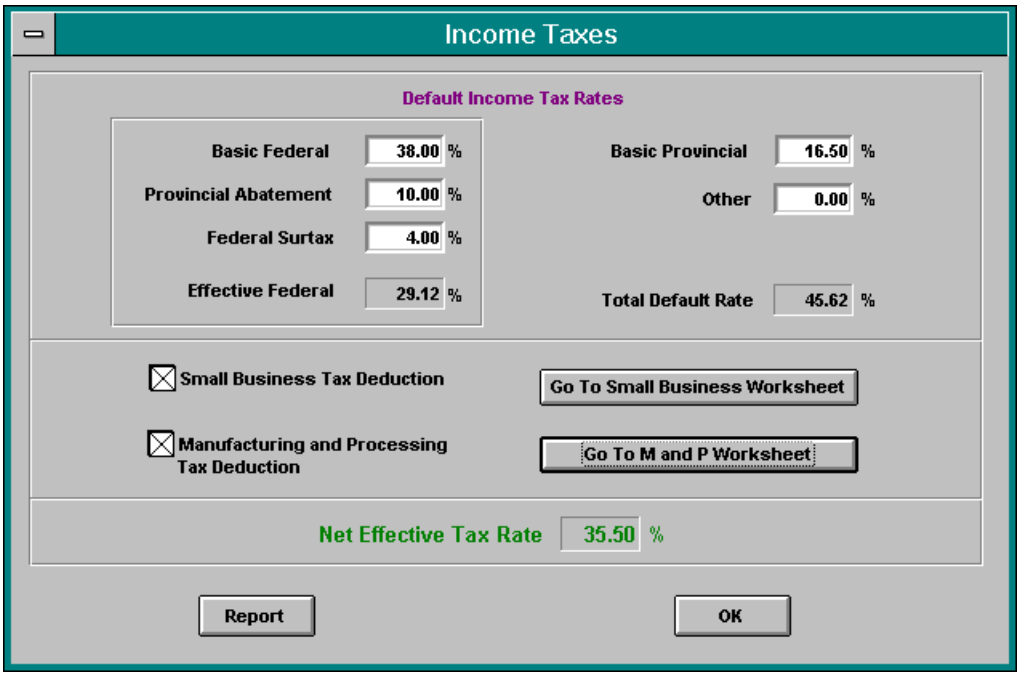
P2/FINANCE-BC uses the lifetime you enter to set a cap on the number of years for which you can enter operating cost data and the extent of results that the analysis will generate. You will not be able to set Reporting Years (described in Section 6.2.1) beyond the Option's lifetime. The software will recognise gains and losses from assets that fully depreciate and working capital that is recovered only within the Option's lifetime.

1. To enter the Option's lifetime, click on the *Option Lifetime (years)* box on the **Investment Costs** or **Operating Costs** page.
2. Type in the lifetime you want to use for the Option, in round years, and hit Enter.
3. A dialogue box will ask you to confirm that you want to change the Option lifetime parameter. Click *Yes* to confirm or *No* to cancel.

4.3.2 Income Taxes

Income taxes play a major role in determining the profitability for any Option and are calculated at a company-wide level. Therefore, when you are defining your income tax rates for the analysis, consider whether the Option would change your current income tax

rates. Appendix B provides detailed information about income taxes and how P2/FINANCE-BC incorporates them into the analysis.



P2/FINANCE-BC comes loaded with default tax rates which are the prevailing rates in British Columbia and Canada in 1996.

To change the default rates for federal, provincial, and other levels

1. Click once on the *Tax Rates...* button. A dialogue box titled Income Taxes will pop up with fields for basic federal, provincial abatement, federal surtax, basic provincial, and other tax rates.
2. The basic federal tax data box will have white text on a blue background which identifies it as the active box. Type in the applicable basic federal tax rate, then hit Tab, Enter, or use the mouse to move to the next tax rate box.
3. Type in the next tax rate you want to change, then move to the next if applicable. Notice that each time you enter tax rate information and then hit Tab or Enter, the effective tax rates are updated in the *Effective Federal* and *Total Default Rate* boxes.

If you do not have either of the Tax Deduction check boxes selected, the Net Effective Tax Rate will have the same value as the Total Default Rate.

To have the software calculate a Small Business Deduction (described in Appendix B) and/or a Manufacturing & Processing Deduction (also described in Appendix B):

Note: P2/FINANCE-BC assumes that investment tax credits are not widely available and does not have them included as a unique feature. Users who do have access to these credits may enter their impact as an individual cost item.

1. If the appropriate check box is unchecked, click on it. If it has already been checked, click on the corresponding *Go To* button.

2. Use the same process as described for basic income tax rates to enter or change the relevant values.
3. When you have finished, click Return to Main Tax Screen.
4. A dialogue box appears asking you to confirm the change. Click *Yes* to continue.

Note that when you return to the Income Tax screen, the Net Effective Tax Rate box will have been updated to reflect any deductions for which you were eligible.

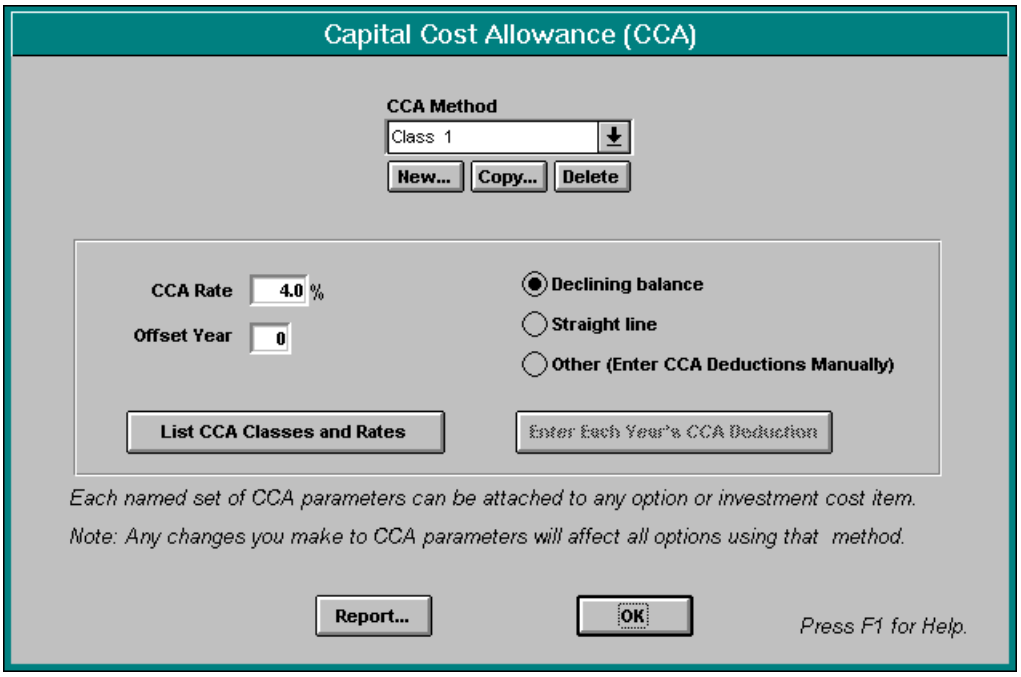
To view a report of how the Net Effective Tax Rate was calculated, click on the Report button. Otherwise, click on *OK* to return to the **Investment Costs** page.

4.3.3 Capital Cost Allowance (CCA)

A corporation may deduct part of the capital cost of a depreciable property from income it earned in a given year. This deduction is referred to as Capital Cost Allowance (CCA). Depreciating an asset via the CCA is a means of distributing its cost over the years in which it is used. The CCA is considered a cost that is subtracted from gross profit in order to calculate pre-tax profit. Thus, the higher the CCA, the lower the taxable income and the lower the tax you have to pay. Lower taxes paid mean higher cash flows and higher investment profitability. It is therefore important to optimise the CCA of your assets within the constraints of the tax code. (See Appendix C for more detail on CCA.)

4.3.3.1 Developing CCA Methods

In P2/FINANCE-BC, you determine the parameters for the CCA of investment cost items. The software allows you to define one of the common CCA methods or to define each year's CCA. P2/FINANCE-BC comes pre-loaded with many of the common CCA classes and their associated rates.



1. To get to the *CCA* dialogue box, click once on the *CCA...* button from the **Investment Costs** page. The dialogue box will show the current default method in the window and the parameters that define it below.
2. To create a new CCA method, click on the *New...* button under the drop-down box window. A smaller dialogue box will appear prompting you for a name for your new method.
3. Type in the name you want to use and click *Create*.
4. Using the Tab key, an arrow key, or the mouse, move the cursor to the *CCA Rate* data box and type in the CCA rate (as a percentage).

If you do not have your own nomenclature for different CCA methods, it may be helpful to use the format xx/cr/oy, where xx represents the method (SL for straight-line, DB for declining balance, or EY for each year's CCA), cr represents the CCA rate, and oy represents the offset year. For example, DB/30/0 is declining balance CCA at 30% with a 0-year offset.

5. Next move to the *Offset Year* data box and enter the number of years to offset CCA.
6. Now you need to choose among the three CCA methods using the radio buttons. If you choose to enter each year's CCA, a new dialogue box will open in which you can enter a specific percentage of the asset that will depreciate for each year.

Please note that you cannot depreciate an asset beyond its full cost, i.e., more than 100%.

7. You have now created a new CCA method. To create another, simply repeat the above steps (starting with Step 2). When you are ready to exit the *CCA* dialogue box, click *OK*.
8. A dialogue box appears asking you to confirm the change. Click *Yes* to return to the **Investment Costs** page.

The new method(s) you create—in addition to those pre-loaded in the software—are now in the drop-down list box next to the CCA button. Select the method you want to use as your default. P2/FINANCE-BC will ask you to confirm this change. Click *Yes* to confirm.

Please note, you can copy or delete CCA methods as well from the *CCA* window. If you change an existing CCA method, it will be changed for all Options in all directories. Unless you are making a change that you are sure you want to be permanent, it would be better to copy an existing method and rename it rather than simply changing it.

4.3.4 Inflation

The last of the Option Parameters relating to investment costs is inflation. The inflation figure you use here should be your best estimate of the average annual rate of inflation of all costs and cost savings for the lifetime of the Option. The rate you choose will apply to both Investment and Operating costs.

1. To enter the inflation rate, click on the *Inflation Rate* box on the **Investment Costs** page.
2. Type in the inflation rate you want to use for the Option and hit Enter. A dialogue box will ask you to confirm that you want to change the inflation rate parameter.
3. Click *Yes* to confirm or *No* to cancel.

4.4 Data Entry

In the data window that covers the bottom half of the **Investment Costs** page, you will see a spreadsheet with the cost items from your inventory in the left-hand column. Across the top of the spreadsheet are boxes (called cells) labelled Cost ($), Salvage ($), Equipment Life, and CCA. You will notice that some of the cells below these headings are white while others are grey. This colour coding indicates the cells in which you can enter information; the cells with the white background allow user input.

Data you enter in this window will be applied only to the Option name and investment year showing on the upper half of the **Investment Costs** page. If you have an Option with multi-year investments, you will have to enter data for each year. (See Section 4.2.1 for a discussion about copying cost data to different investment years.)

4.4.1 Cost Data

The white cells in the Cost ($) column show where you can enter cost data, in round dollars, for each cost item you selected from the cost inventory. It is important to note that P2/FINANCE-BC will NOT calculate sales tax for you automatically.

It is important to include *sales tax* in the cost for each item.

1. To enter cost data, place the cursor anywhere inside the data window and click once to activate it.
2. Move the mouse arrow to the first box in which you want to enter data, and click once. You will see a vertical blinking-bar cursor in the cell. You can now type in the dollar amount of the cost. Once the number is typed, you can either hit the Return key or move the mouse arrow to the next box and click on it.

P2/FINANCE-BC only accepts whole dollar numbers, i.e., the software will not recognise cents, so round to the nearest dollar. Also, the cells are not equipped to perform mathematical functions. You can use the on-line calculator (see Section 2.2.4.2) to make any calculations you need.

3. To modify existing cost data, simply repeat the above procedure to overwrite your previous entry.

The next column, which also contains cells with a white background, shows where you can enter *Salvage Value*. Salvage value reflects the dollar value of the equipment at the end of the Option's duration, i.e., the amount for which your can sell the equipment. You enter these data just as you entered cost data, in whole dollars. If you do not anticipate the item will possess value at the end of the Option's duration, you can leave this cell blank.

If you enter a *Salvage Value* for a particular cost item, you also need to enter a value for *Equipment Life*. This number represents the expected lifetime of the item, which may be different than its tax life. For example, you can depreciate a new piece of equipment over five years for tax purposes, but you may expect it to be useful for eight years. In this case, your depreciation method will be based on five years, but you will set the *Equipment Life* equal to eight.

4.4.2 CCA Method Selection

The final step for entering a cost item is setting the CCA method. The CCA for a cost item is automatically set to *Default,* referring to the CCA method appearing in the *Option Parameters* panel. You can change the CCA for a specific cost item as follows.

1. When you click on a white cell in the *CCA* column, a window with the established CCA methods will appear.
2. Using the arrow keys or the mouse, select the method you want to use for the particular item. If you use the mouse, simply click on the method; if you use the arrow keys, hit return after you have highlighted the method. If none of the methods that appear is appropriate for the item, you need to develop a CCA method.

Default refers to the method that is visible in the CCA drop-down box window on the Option Parameters panel. If you change which method shows in this box, all cost items that have Default selected as their CCA method, will use the new method shown in the window. Expensed means that the entire cost of the asset will be charged in the first year of the investment. In other words, if you expense an item, you are not depreciating it, but rather are treating it like any other business expense.

Once you have completed a row, you can move on to the next and repeat the above process. If there are problems with your entry, P2/FINANCE-BC will alert you and suggest corrections before advancing you to the next cost item.

4.4.3 Working Capital

When beginning a new process, developing a new product, or increasing production capacity, it may be necessary to temporarily set aside funds for Option start-up. These temporary investments can be recovered by the company at the end of the Option's lifetime. For the Option's duration, though, these investments are "tied up" in the Option (i.e., not available for other investments) and the time value of money must be accounted for through the application of an inflation rate and a discount rate. An investment in inventories is a common working capital consideration that is relevant for the financial analysis of an Option. For example, it may be necessary to purchase $3000 worth of inventory in raw materials when you bring a new piece of equipment on-line at the end of Year 0, knowing that you can recover these costs by liquidating (i.e., selling) the inventory at the end of the Option's lifetime. In this example, you would incur a cost at the end of Year 0 (included in the Investment Cost) and see a revenue (i.e., a release of the tied up funds) at the end of the Option's lifetime (included as Final Year Working Capital). Because working capital is recovered by the company, it cannot be depreciated, and therefore you cannot enter a salvage value or CCA method.

Working capital on a facility-wide basis includes the amount of capital tied or freed up in accounts receivable, accounts payable, taxes payable, inventories and cash requirements. For a particular Option, working capital can be estimated as a percentage of the expected change in revenues due to the Option. If the company's operations are stable and the proposed Option is not expected to have a significant impact on the company's revenues, the change in working capital is likely to be small and can be omitted from the analysis. On the other hand, if you will need to develop an inventory for a proposed Option, its costs should be included in the analysis as working capital.

4.5 Generating a Report

From the **Investment Costs** page you can generate a report that shows all of your investment costs and associated parameters. By simply clicking on the *Report* button, a report like the one following will be generated.

Directory: CASESTUD INVESTMENT COSTS 09/01/1997
Option: Plastic-Coated Racks Page 1

Option Parameters
Lifetime: 5
Tax Rate: 35.07%
Depreciation: Class 1
Inflation Rate: 3.00%

Year 0 Costs	Cost ($)	Salvage ($)	Equipment Lifetime	Depreciation
Plating Process				
Purchased Equipment				
Process Equipment	18,500	2,000	5	Class 24
Materials				
Structural	2,000	2,200	5	Class 43
Construction and Installation				
Downtime	5,000			Expensed
In-house Labour	150			Expensed
Start-up and Training				
Manufacturing Trials/Variances	200			Expensed
Contingency				
Contingency fund	2,000			Expensed

All costs reported in Year 0 dollars

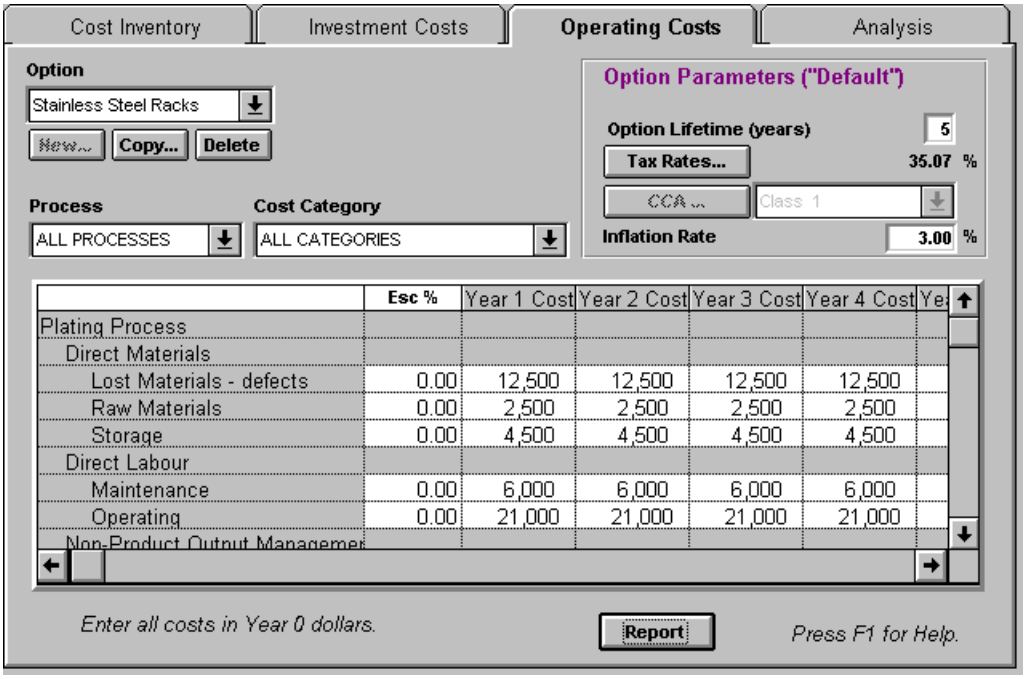
In the upper left-hand corner of the report screen the menu headings *File, Edit* and *Text* appear, which allow you to print or save the report. See Section 6.3.2 for a full description of saving and printing reports.

5. Operating Cost Data Entry

As previously noted, the quality of the data you gather and enter into the program ultimately governs the utility of the analysis. The more reliable and accurate the data, the better and more effective the output of the program. Remember, the purpose behind performing this type of analysis in the first place is to reflect the true costs of an Option in order to assess its relative profitability. The use of cost data that are inaccurate can skew the analysis and paint a distorted picture of the financial viability of the Option.

The operating costs and cost savings you enter will accrue to the Option each year of its life. Operating cost data errors will thus be magnified throughout the lifetime of the Option. It is therefore important to make the most realistic estimates of operating costs and cost savings possible. Use current practices as a benchmark when considering the effects of a new investment or process change on your operations. When the best estimate you can make is a range of costs (e.g., labour costs will be reduced by 20-35%, material costs will drop 10-15%), use P2/FINANCE-BC to run multiple scenarios to determine the sensitivity of the overall analysis to these ranges. If the end result does not change significantly with changes in these costs, then you can simply use an average. If the result does change, you either have to invest the time in getting a better estimate, or use the worst case to be conservative.

Operating cost data are entered on the third page of the program, **Operating Costs**, pictured below. The upper left portion of the box displays the same format and choices you saw on the **Cost Inventory** page, except for the *Investment Year* box which is not relevant to operating cost data. The upper right portion of the page, like on the **Investment Costs** page, shows a small box wherein you will establish the Option's financial parameters, if you have not done so already. If you entered these data on the **Investment Costs** page, you need not re-enter them on the **Operating Costs** page. Changes made to *Option Parameters* on the **Operating Costs** page will affect data previously entered on the **Investment Costs** page. The entire bottom portion of the page shows a data window where the actual data will be entered. These latter two portions – the *Option Parameters* and the operating cost data window – are described in detail below.



All cost data entered in P2/FINANCE-BC are considered to be in year zero dollars. Because the software includes the effects of inflation in its analysis, this feature is important to be aware of and understand. For operating costs, this distinction is important because annual costs and cost savings are assumed to rise over time as a function of inflation and escalation. Please note that the inflation rate you choose for the Option will apply to both Investment and Operating costs.

5.1 Option Name

Just as you can from the **Cost Inventory** and **Investment Costs** page, you can copy or delete an Option from the **Operating Costs** page.

5.1.1 Copying an Option

P2/FINANCE-BC allows you to copy previous Options that you can then modify as needed for your next analysis. This feature is useful at different stages of your analysis when you want to conduct sensitivity analyses for various cost items. See Section 3.1.2 for specific instructions on how to copy an Option.

5.1.2 Deleting an Option

Just as you can create a new Option, you can delete an existing Option. See Section 3.1.2 for specific instructions on how to delete an Option.

5.2 Option Parameters

To properly measure the profitability of an investment, you need to calculate the cash flows that will result from that investment. The calculation of cash flows requires the imposition of financial parameters that characterise the monetary aspects of your invest-

ment. P2/FINANCE-BC helps you define these parameters and then uses them to shape the analysis. In this way, you can tailor the analysis to your particular situation by using parameters relevant to your facility and the Option you want to analyse. For operating costs and cost savings, you will want to consider Option lifetime, taxes, and inflation. These Option parameters will be the same for both Investment and Operating costs.

5.2.1 Option Lifetime

The lifetime of the Option is composed of many variables such as the expected lifetime of the equipment and the number of years for which operating costs and cost savings are reasonably predictable. P2/FINANCE-BC uses the Option lifetime you enter to limit how far forward operating costs and cost savings are projected and the extent of results that it will generate. See Section 4.3.1 for instructions on setting the Option's lifetime.

5.2.2 Income Taxes

Income taxes play a major role in determining the profitability for any Option and are calculated at a company-wide level. Therefore, when you are defining your income tax rates for the analysis, consider whether the Option would change your current income tax rates. Appendix B provides detailed information about income taxes and how P2/FINANCE-BC incorporates them into the analysis.

For instructions on making changes to the default rates for federal, provincial, and other levels and having the software calculate a Small Business Deduction (described in Appendix B) and/or a Manufacturing & Processing Deduction (also described in Appendix B), please refer to Section 4.3.2.

5.2.3 Inflation

The last of the Option Parameters relating to operating costs is inflation. The inflation figure you use here should be your best estimate of the average annual rate of inflation of all cases for the lifetime of the Option. Please note that the rate you choose for an Option will apply to both Investment and Operating costs. Refer to Section 4.3.4 for instructions on entering or changing the Option's inflation rate.

5.3 Data Entry

In the data window that covers the bottom half of the **Operating Costs** page, you will see a spreadsheet with the operating cost items from your inventory in the left-hand column. Across the top of the spreadsheet are boxes (called cells) labelled Esc %, Year 1 Cost, Year 2 Cost, etc. Just as in the **Investment Costs** data entry box, you will notice here that some of the cells below these headings are white while others are grey. This colour coding indicates the cells in which you will enter information; the cells with the white background allow user input. (However, white cells beyond the Option's lifetime will not accept user input.)

5.3.1 Escalation

In addition to the base inflation rate, the program allows you to identify escalation rates for individual operating cost items. Escalation, defined as a percentage, represents cost increases different from the inflation rate. For example, non-product output disposal costs often rise at a rate higher than inflation. If you predict that inflation will be 3%, but that non-product output disposal costs will rise an average of 6%, then the escalation rate for non-product output disposal costs is equal to 3%, i.e., the difference between the item-specific price increase and the overall inflation rate.

Note: An escalation rate can be a negative percentage, indicating that for a particular cost item, costs and cost savings are expected to rise at a rate lower than inflation.

The white cells in the Esc % column allow you to enter an escalation percentage, if applicable, for each cost item.

1. To enter an escalation, place the cursor anywhere inside the data window and click once to activate it.
2. Move the mouse arrow to the first box in which you want to enter data, and click once. You will see a vertical blinking-bar cursor in the cell. You can now type in the escalation percentage associated with the item. Once the number is typed, you can either hit the Return key or move the mouse arrow to the next box and click on it.
3. To change a percentage already entered, simply repeat the above procedure to overwrite your previous entry.

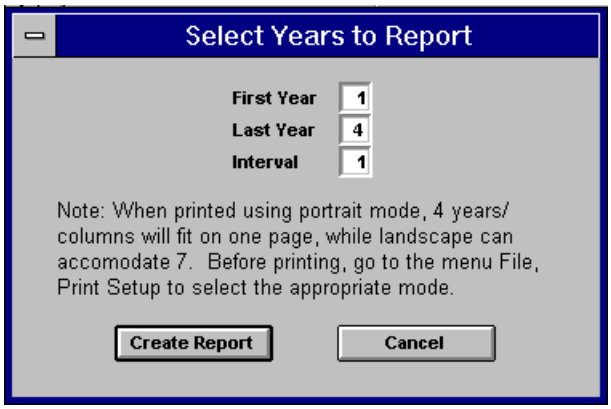
5.3.2 Cost Data

The next column that will also contain cells with a white background allows you to enter cost data, in round dollars, for each item you selected from the cost inventory. It is important to note that P2/FINANCE-BC will NOT calculate sales tax for you automatically. You must include sales tax in the cost for each item. You enter these data just as you entered the escalation percentages. Step-by-step instructions can be found in Section 4.4.1.

Once you enter a cost, the value automatically appears in subsequent cost year columns for as many years as specified for the Option lifetime. P2/FINANCE-BC provides the flexibility to manually alter these costs. For example, if you are installing a computerised pre-press system and plan to eliminate your use of a service bureau after your system has been operating for two years (as you build capabilities and become self-sufficient), you would enter your expected service bureau costs for Year 1. This cost would automatically appear in subsequent years. By changing the cost to 0 in the Year 3 cell, service bureau costs for Year 3 and subsequent years would become $0.

5.4 Generating a Report

From the **Operating Costs** page you can generate a report that shows all operating costs and revenues for the Option. Listed in the report are the default financial parameters defined for the Option, and the percentage by which each cost will inflate each year (inflation plus escalation). To generate a report, click on the *Report* button. The *Select Years to Report* box will appear. Chose the years for which you would like to operating cost data. Then click the *Create Report* button.



A report like the one shown below appears.

```
Directory: CASESTUD                    OPERATING COSTS                      09/01/1997
Option: Plastic-Coated Racks                                                  Page   1

Option Parameters
  Lifetime:  5
  Tax Rate: 35.07%
  Inflation Rate:   3.00%     Escalation
                               Rate (%)    Year 1   Year 2   Year 3   Year 4   Year 5
================================================================================================
Plating Process
  Direct Materials
    Lost Materials - defects                 4,200    4,200    4,200    4,200    4,200
    Raw Materials
    Storage
  Direct Labour
    Maintenance                             10,000   10,000   10,000   10,000   10,000
    Operating                               12,000   12,000   12,000   12,000   12,000
  Non-Product Output Management
    Disposal
  Regulatory Compliance
    Labeling
    Testing
  Non-Deductible Taxes/Items
    Non-Deductible Reserves
  Revenues (Revenue)
    Sale of Old Equipment        -3.00       1,200

  All costs reported in Year 0 dollars
```

In the upper left-hand corner of the report screen the menu headings *File*, *Edit*, and *Text* appear, which allow you to print or save the report. See Section 6.3.2 for a full description of saving and printing reports.

6. Analysis

Once you have developed your cost inventory and entered the relevant cost and financial data, the bulk of the work is behind you, and you are ready to run your analysis from the **Analysis** page. Please refer to British Columbia's Ministry of Environment, Lands and Parks' *Total Cost Assessment Guidelines: Preparing the Business Case for Pollution Prevention Projects* for a more detailed discussion of analysing financial performance.

6.1 Incremental vs. Stand-Alone Analysis

P2/FINANCE-BC can not only calculate the profitability of a single Option, but also can compare one Option to another. If you are considering one or more alternative Options, P2/FINANCE-BC allows you to directly compare your current operations, as a baseline, against the alternative Option(s). An incremental analysis calculates results for all Options selected, then calculates the difference between each alternative and the base case Option.

1. To run an incremental analysis, you must first determine which Option is your reference, or base case, Option. It is best to use your current operations as the base case Option because it is your true baseline for comparison. If you are comparing two different Options to each other, the choice of which is the reference is less important. In the *Base Option* drop-down box on the **Analysis** page, select your reference Option.
2. Make sure the *Incremental Analysis* box is checked.
3. The *Alternatives* list box below contains a list of all Options in this directory. Select the Option you want the software to analyse as the alternative Option by double-clicking the Option. A chevron (») appears to the left of the selected Option.

If your Option does not have direct bearing on your current operations or if you simply do not want to use a baseline for comparison, you can run a stand-alone analysis.

1. To run a stand-alone analysis, select the Option you want to analyse in the *Base Option* drop-down box.
2. Make sure the *Incremental Analysis* box is NOT checked.

6.2 Analysis Parameters

6.2.1 Reporting Years

The next step in running the analysis is to establish the final parameters needed for the financial calculations. The year and interval parameters allow you to specify which years of the Option to view in the report. Your choice here does not affect the calculations; it is merely a means for you to limit the information presented in the report you generate.

One of the elements of TCA that distinguishes it from traditional capital Option analyses is that it uses an expanded time horizon over which to view investments. Many businesses calculate the return on their investments over a period of two to three years, a time horizon that may be inadequate to capture the full costs and savings from a pollution prevention Option. Because some of these cost savings from P2 Options may take longer to materialise, it is important to maintain a longer-term perspective on P2 Options so that the true benefits are realised in the analysis.

1. To specify a range of years for your analysis report, enter the first and last years you want to view in the data boxes on the *Analysis Parameters* panel of the **Analysis** page.
2. You can further restrict the report output by specifying an interval by which the data will be displayed (e.g., every other year, every third year). Enter the interval in the data box on the same panel.

6.2.2 Discount Rate

A critical component of assessing the performance of a long-term Option is incorporating the notion that the value of money changes over time. There are two aspects of how people value money that render this concept important. Central to this idea is the assumption that money loses its value over time. In any economic system experiencing monetary or economic growth, prices of goods and services inevitably rise over time. This inflation of prices means that the value of a dollar decreases over time. A dollar at any point in the future has less purchasing power than it does today. So, the first aspect of the time value of money is that, due to inflation, money today has more value than money tomorrow.

The second aspect of the time value of money is that, even without inflation, most people (or businesses) would prefer to have money sooner rather than later. Called the time preference of money, this idea keys on the concept of opportunity cost. If you have money today, you have the opportunity to use it now to grow your business, for example. Even if prices remain stable – i.e., the money will not lose purchasing power over time – it is better to have the money now so that you have the opportunity to use it in ways that can make the money grow. Put another way, there is a cost if you receive the money tomorrow instead of today.

Putting these two ideas – inflation and opportunity cost – together, you need a way to account for the time value of money. You need to adjust the value of future dollars to re-

flect their diminished value to you today. The mechanism for making this adjustment is called a discount rate.

A discount rate is a percentage that is applied to a future sum or stream of cash flows to reflect the cost of not having it today. Typically, for business decisions, the discount rate chosen represents the business's cost of capital plus some level of desired return on an investment plus an additional margin to account for uncertainty. The cost of capital is your cost of tax-adjusted debt and equity costs to funding your operations. The return on investment your business achieves above this cost is your profitability. On an economic basis, any new investment should meet that return. Because your investments also have risk associated with them (as compared to taking the money and putting it in the bank), you may want to discount the expected returns further to account for that risk. However, it is best to decouple the risk and directly account for it within the analysis. Users should reference British Columbia's Ministry of Environment, Lands and Parks' *Total Cost Assessment Guidelines: Preparing the Business Case for Pollution Prevention Projects* for a more detailed discussion of discount rates.

Enter the discount rate for the Option as a percentage in the *Discount Rate* data box on the *Analysis Parameters* panel on the **Analysis** page.

6.3 Analysis Output

When you generate a report, you must choose how you want to format your report and whether you want to display it on the screen or print it out.

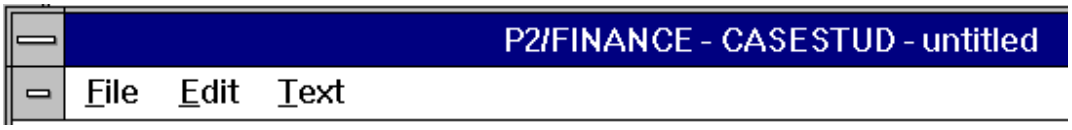
6.3.1 Format

P2/FINANCE-BC gives you a choice for formatting your output. You can specify the order in which the results are presented. Relevant for the Summary Report, this choice allows you to choose whether to order costs first by process (e.g., list all Process 1 costs, then all Process 2 costs) or by category (e.g., list all Materials costs, then all Labour costs).

6.3.2 Output

A screen report allows you to quickly review the results of the analysis, to check for accuracy, or to determine appropriate sensitivity analyses. All reports generated by P2/FINANCE-BC follow roughly the same format, and can be saved and printed in the same manner as follows.

When you click on a report button in P2/FINANCE-BC, a new window appears with a banner and menu headings as above. Scroll bars on the right-hand side and bottom of the window enable you to scroll through reports too large to fit on your screen. From this



window, you can copy, save, and print the report shown.

6.3.2.1 File Menu

The File menu contains commands that let you print and save reports.

To save a report as a text file:

1. Choose *Save As...* under the *File* menu.
2. A dialogue box appears, prompting you for the name of the file. Since this file will be a regular DOS file, it is subject to standard DOS limitations.[3] In the above picture, the filename would replace the word *untitled*. In this dialogue box you can also choose the directory in which to locate the file.
3. Click *OK* to return to the report window.

To change print settings:

1. Choose *Print Set-up...* under the file menu.
2. Select the printer, the orientation (portrait or landscape), the paper size and source, and, optionally, the dithering and intensity control.
3. Click *OK* to return to the report window.

To print your report, simply choose *Print...* under the file menu. The report is queued to the printer chosen from the *Print Set-up* window. P2/FINANCE-BC works with any printer you are using in Windows.

6.3.2.2 Edit Menu

From the *Edit* menu, you can copy text using *Copy* (CTRL+C) which becomes active once text has been selected. You can select text by highlighting it with the mouse or the keyboard, or, if you want to copy the whole report, by choosing *Select All* (CTRL+A). The selection is copied to the Windows clipboard from which you can paste it to a word processor or other file.

6.3.2.3 Text Menu

The choices in the *Text* menu allow you to change the appearance of the report. You can change the font type and size, the line spacing, and other style features.

6.4 Generating Reports

Once you have established your analysis parameters and format, you are ready to generate reports. P2/FINANCE-BC creates four different reports to allow you to look at different aspects of the analysis.

[3] The name before the period can be up to eight characters; the extension after the period can be up to three characters. File names are not case sensitive; cannot contain spaces, commas, backslashes, or periods; and cannot be identical to other file names. Only the letters A through Z, numbers 0 through 9, and certain special characters [_ ^ $ ~ ! # % & - { } @ ` ‘ ( )] can be used in file names. It is recommended that .TXT be used as the extension for P2/FINANCE-BC report filenames.

6.4.1 Summary Report

Summary Reports may be generated for both stand-alone and incremental analyses. A summary report depicts the Option as it was defined in the cost screens without performing any of the calculations. It lists the parameters and cost data you entered.

A capital cost summary report lists the amount (in Year 0 dollars) of the investment. The operating cost summary lists the cost and revenue data (also in Year 0 dollars) for each cost item. Summary reports provide a quick look at the Option data and financial parameters. You must generate a separate summary report for operating and investment costs.

To generate the report, select *Summary* and either *Investment Costs* or *Operating Costs* from the *Report to Create* panel on the **Analysis** page.

6.4.2 CCA Tax Deduction Report

Capital Cost Allowance (CCA) Tax Deduction Reports can be calculated for both stand-alone and incremental analyses. This report displays the investment items and calculates any relevant investment-related tax deductions during each year of the Option's life. For each capital item, this report lists the CCA method chosen, the undepreciated capital cost (UCC) of the investment (in Year 0 dollars), the amount depreciated each year, the salvage value, and capital gain and CCA recapture at the end of the equipment's life if the lifetime is within the analysis reporting years. The report shows only the initially expensed cost amount for items that are expensed, and "n/a" for working capital items since they are not depreciated. The report then summarises the total CCA, initially expensed costs, and capital gains and CCA recapture accrued for each year and calculates the amount of the tax deduction. In this report, the tax deduction is determined as CCA plus initially expensed costs less capital gains and recapture. A negative value for CCA Recapture indicates a Terminal Loss.

To generate the report, select *CCA Tax Deduction* from the *Report to Create* panel on the **Analysis** page.

6.4.3 Cash Flow Report

Cash Flow Reports can be calculated for both stand-alone and incremental analyses. For an incremental analysis, a cash flow report calculates the difference between the two Options. A cash flow report views the scenario over time and allows you to see the calculations clearly. Cash flow reports include the effects of inflation and escalation.

The Cash Flow Analysis report is the basis for calculating the Option's profitability and is separated into two sections: Tax Calculation and Cash Flow Calculation. For the Tax Calculation, the first line lists the Option's revenues and the next lists operating costs or savings. These costs appear negative if the alternative Option has lower operating costs than the reference Option.

CCA and expensed capital costs are then subtracted because Revenue Canada allows you to amortise your capital investments over time through CCA tax breaks. Any items in the Non-Deductible Items category are added back so they are not deducted from taxes. (This category of items is included with the operating costs that have been subtracted from revenues. These items therefore must be added back so that they are counted as

taxable income.) Finally, the difference between salvage value and undepreciated capital cost (capital gain and CCA recapture), when applicable, is added to calculate the Taxable Income. Based on this taxable income, income tax is calculated by applying the Net Effective Tax Rate.

The Cash Flow Calculation starts with the operating savings or costs as above. The total taxes calculated in the first section of the report are then subtracted. Then, other costs and revenues associated with the investment are included: Investment Costs, Working Capital Recovery, and Salvage Value. Working Capital Recovery equals the amount of capital that is freed up at the end of the Option's lifetime. (Note that the initial working capital outlay is included in the Investment Cost). Salvage Value is the expected revenue from the resale of the Option equipment at the end of the Option's lifetime. The result of these operations is the After-Tax Cash Flow. The After-Tax Cash Flow is then discounted to calculate the Discounted Cash Flow for each year. Users should reference British Columbia's Ministry of Environment, Lands and Parks' *Total Cost Assessment Guidelines: Preparing the Business Case for Pollution Prevention Projects* for a more detailed discussion of cash flow analysis.

To generate the report, select *Cash Flow* from the *Report to Create* panel on the **Analysis** page

6.4.4 Profitability Report

The Profitability Analysis Summary report uses common financial indicators to measure the profitability of an Option. This information can help you make well-informed decisions as to how to reinvest in your business or modify current practices to reduce costs and/or increase revenues. Profitability can be calculated for a stand-alone analysis, an incremental analysis, or multiple incremental analyses in which more than one alternative to the current Option is identified.

One of the important components of Total Cost Assessment (TCA) is the use of multiple financial indicators in measuring profitability. P2/FINANCE-BC offers three indicators: Net Present Value, Internal Rate of Return, and Discounted Payback. Each indicator has specific strengths and weaknesses. By considering all three indicators you can minimise these limitations and gain a deeper understanding of the Option's profitability.

P2/FINANCE-BC, through this report, provides a financial assessment of an investment. Good management decision making requires the consideration of not only the financial aspects of an investment, but also the technical, environmental, safety, strategic, organisational, and other non-financial aspects. Thus, P2/FINANCE-BC is a tool to support just the financial aspect of decision making. Managers should always comprehensively consider investments in terms of their overall impact on their firms and relevant stakeholders.

Users should reference British Columbia's Ministry of Environment, Lands and Parks' *Total Cost Assessment Guidelines: Preparing the Business Case for Pollution Prevention Projects* for a more detailed discussion of analysing financial performance.

6.4.4.1 Net Present Value (NPV)

Net Present Value (NPV) is the sum of the discounted cash flows. An Option with an NPV of zero provides a return equal to your discount rate. Therefore, any Option with a negative NPV is unprofitable (i.e., provides a return below your discount rate), and any Option is with a positive NPV is profitable. If you are considering only one Option, it is financially justifiable if the NPV is positive. If you are looking at a number of Options and must prioritise among them, you should choose the one with the highest NPV, i.e. the most profitable one.

NPV is a very useful indicator because it is a direct measure of the Option's profitability in dollars and therefore most directly relates to the company's interests (i.e., higher cash flows). It does, however, depend significantly on the value of the discount rate. If you are not comfortable with your chosen discount rate, you can perform a sensitivity analysis by trying different discount rates and comparing the results. In general, NPV is the strongest of the three indicators because it has few limitations and can be used in all types of analyses.

The profitability report lists NPV (and IRR) under each year you specified in the *Analysis Parameters* panel. The dollar values (or percentages) under a given year represent the NPV (IRR) from Year 0 through that year.

6.4.4.2 Internal Rate of Return (IRR)

IRR is the discount rate that makes the Net Present Value (NPV) of the discounted cash flows equal to zero. The IRR can thus be compared to the company's discount rate or to the IRR calculated for other Options. If the IRR is higher than the company's discount rate, then the Option is profitable. When comparing multiple investments, the one with the highest IRR is the most profitable.

IRR is a useful indicator because it is easy to interpret and considers equally all of the cash flows of the investment. P2/FINANCE-BC calculates IRR for the range of years and interval you specify in the Report Screen.

Despite these benefits, IRR does have its limitations. For example, if you are performing a complex analysis (e.g., capital costs in multiple years or widely fluctuating operating costs and revenues), you should avoid using this indicator. P2/FINANCE-BC does not calculate IRR if the analysis is too complex, instead reporting "N/A". (Complex analyses contain more than one change in the mathematical sign of the cash flow, allowing for multiple IRR values).

In addition, IRR can be misleading because it does not directly measure the magnitude of the cash flow or investment but instead measures the return on the investment. Suppose you are interested in two investments; A requires an initial outlay of $50,000 and B requires only $500. Even if investment B has a higher IRR than investment A, this does not necessarily indicate that B is more profitable for the company in absolute terms. In fact, B can have an IRR of 173% and A an IRR of 85% over the first five years and A would generate more than four times as much revenue. Therefore, when you are comparing investments with significantly different magnitudes of costs and revenues, you should use NPV because it is a direct measure of the dollars the investment will generate.

6.4.4.3 Discounted Payback

Discounted Payback is one of several payback calculations, which, in general, measure the time it takes for a company to break even on an investment. Payback calculations typically do not incorporate the time value of money through discounting. However, P2/FINANCE-BC calculates Discounted Payback, a method that includes inflation, escalation, and discounting. An Option's Discounted Payback is the time at which the Net Present Value of the investment equals zero, i.e., when you have recovered your investment costs.

Many companies base their investment decisions on payback because it is easy to understand and use. Knowing that payback for one press is 4 years while payback for another press is 6 years can help guide decision-making. However, you should be aware of certain limitations of this indicator before using it.

One limitation is that payback does not account for all of the cash flows of an Option. It considers the cash flows before the investment is paid back, but ignores all cash flows after this threshold. Ignoring these later cash flows can mislead you as to the true profit-

Appendix A: Case Study

See downloadable Acrobat document:

p2f_case.pdf

Available from the MELP Web site at
<http://www.env.gov.bc.ca/epd/epdpa/embi/tca/p2f/p2financ.html>

Appendix B: Tax Information

P2/FINANCE-BC has been designed to accommodate British Columbia and Canada-specific tax systems. This Appendix provides background information about these taxes and how they are treated by the software.

Income Taxes

Federal Corporate Income Tax is an income tax levied on the taxable income of both private and publicly traded corporations by the federal government. Taxable income is derived from net income per the income statement by adding back items such as capital gains and CCA recapture and subtracting items such as capital cost allowance. (See Section 4.3.3.) The result is then multiplied by the applicable tax rate.

P2/FINANCE-BC comes loaded with default rates which are the prevailing rates in British Columbia and Canada in 1996. The basic federal rate is 38% but the Federal Abatement of 10%, which is intended to offset Provincial Corporate Income Tax, reduces this to 28%. A surtax of 4% is then applied to the Federal Tax payable bringing the Total Default Rate up to 29.12%. Any of the first three values can be changed (e.g., if tax rate change in future years), and the Total Default Rate will be recalculated accordingly.

Provincial Corporate Income Tax is an income tax levied by provincial governments on the taxable income of both private and public corporations, the British Columbia default rate loaded is 16.5%. A box labelled Other can be used by the user for other income taxes that might be relevant. Both of these rates can also be changed by the user (e.g., by a user in another province).

In cases where a corporation has operations in other jurisdictions, taxable income is allocated, based on a formula, to each province in which the corporation is permanently established. The allocation is generally made on the basis of revenue and salaries paid in each province.

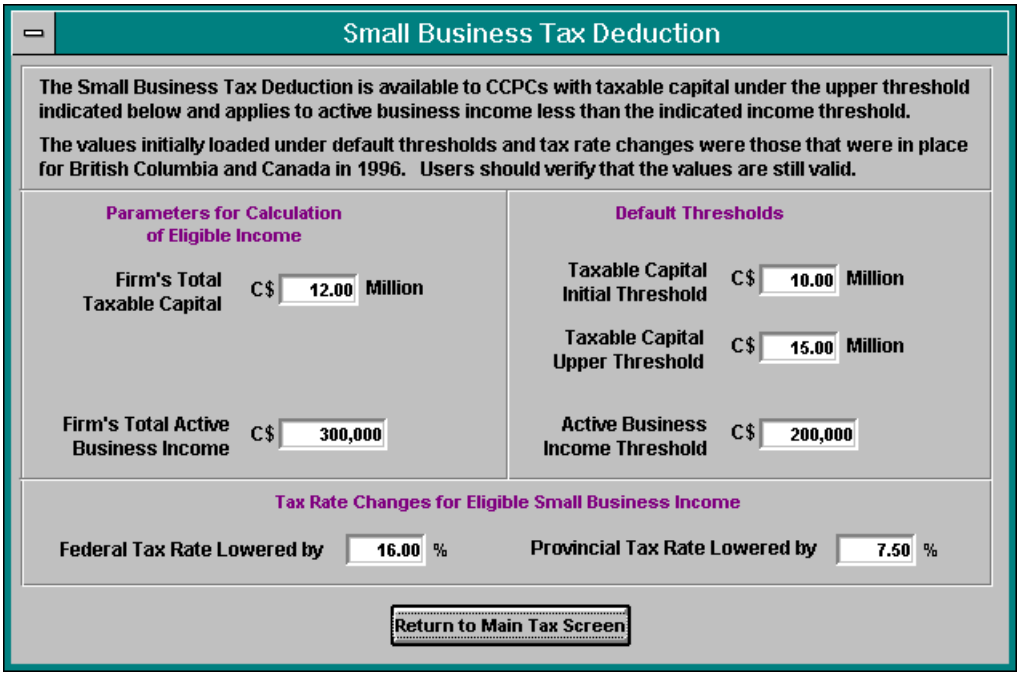
Before considering tax deductions, mentioned below, the software calculates a Total Default (Income Tax) Rate. If no deductions are selected, the Total Default Rate is the rate applied to income for the tax calculation.

The software gives the user the opportunity to calculate a Small Business Tax Deduction and a Manufacturing & Processing (M&P) Tax Deduction. If the user selects one or both of these options, the software uses the firm's total Active Business Income to arrive at a single effective tax rate that is applied to the Option's income. The calculation entails determining how much, if any, of the firm's income is eligible for the Small Business Deduction, then determining how much, if any, of the firm's remaining income is eligible for the M&P Deduction. Taxes for these two amounts of income are calculated and tax on the remaining income is applied at the full default rate. The taxes are summed and divided by Active Business Income to arrive at the Net Effective Tax Rate. This rate is considered to be the income tax rate that applies to the "average" dollar the firm earns and is thus applied to the income from the P2/FINANCE-BC Option.

Small Business Deduction (SBD)

A Small Business Deduction (SBD) may be claimed by Canadian Controlled Private Corporations (CCPCs) on the lesser of income from active business in Canada or the corporation's reduced business limit. The income eligible for SBD is taxed at lower rates than other income; the federal rate is lowered by 16%, and the provincial rate in British

Columbia is lowered by 7.5%. These reductions are based on the prevailing rates in 1996; the user can change them as necessary.



The software prompts the user to enter a single estimate for Active Business Income (exclusive of P2/FINANCE-BC Option income) that covers the current year and years over which the Option will exist. This income is used as the basis for the determination of the reduced business limit, i.e., the amount of income eligible for the Small Business Deduction. This estimate of Active Business Income will require some broad assumptions the user should consider. In essence the assumptions are that income from the Option will be not dramatically affect the corporation's effective tax rate as it presently stands, and that Active Business Income will be relatively stable during the life of the Option. Users should make necessary adjustments if they feel these assumptions may mislead the analysis.

The business limit essentially phases out the Small Business Deduction. The basic business limit is C$200,000 per CCPC or group of associated CCPCs with taxable capital less than the initial threshold of C$10 million. However, if taxable capital is say, C$11 million, the new business limit is reduced by one-fifth. Once taxable capital employed in Canada hits the C$15 million threshold, the SBD disappears entirely. The user enters values for the firm's total taxable capital and total active business income. The user can also change the default thresholds that determine the reduced business limit. The C$200,000 basic business limit, the C$10 million initial threshold, and the C$15 million taxable capital upper threshold are based on prevailing Canadian 1996 tax rules.

The tax rate changes and thresholds mentioned in the preceding paragraphs are those that were in effect in British Columbia and Canada in 1996. Users are strongly encouraged to verify these values are still valid in their geographic region during the year the software is being used.

Users interested in more detail regarding the Small Business Deduction are encouraged to consult the following sources.

1. CCH, Preparing Your Corporate Tax Returns, 1996, 16th Edition, Paragraph 368
2. Revenue Canada, T2 Corporation Income Tax Guide, 1995, Page 43

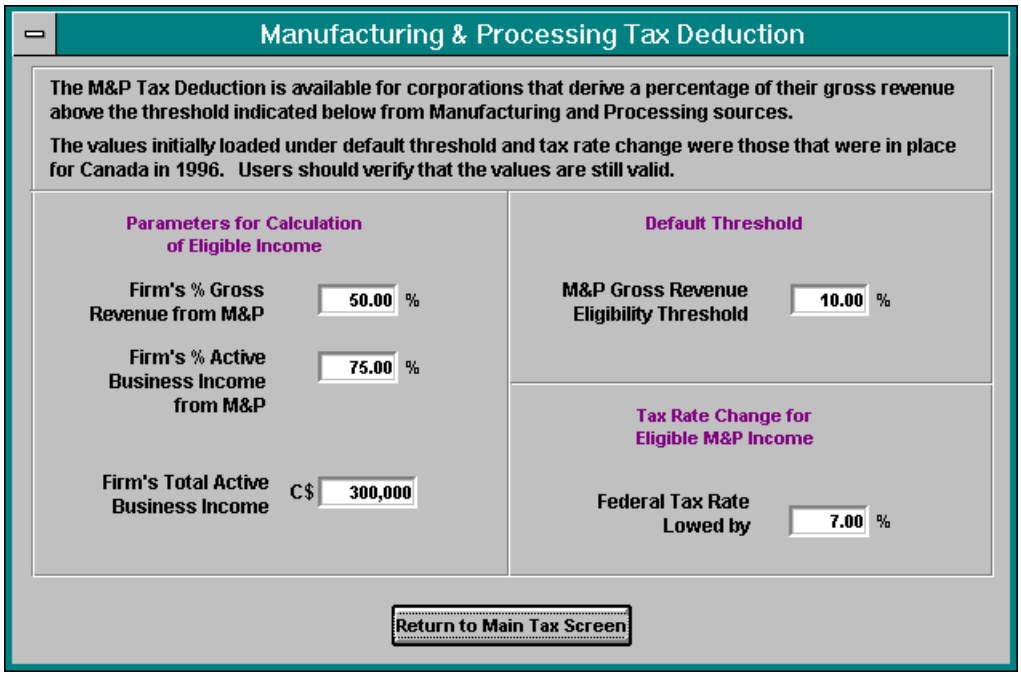
Manufacturing and Processing Deduction (M&P Deduction)

To be eligible for the Manufacturing and Processing (M&P) Deduction, a corporation must derive 10% or more of its gross revenue from all active business in Canada from Manufacturing and Processing. The corporation is eligible for a special credit that lowers the federal tax rate by 7% for that portion of taxable income that qualifies for the M&P reduction. However this reduction does not apply to M&P income that is eligible for the Small Business Deduction. (The tax rate change and eligibility threshold mentioned in this paragraph are those that were in effect in Canada in 1996. Users are strongly encouraged to verify these values are still valid in the year the software is being used.)

The term Manufacturing and Processing is not technically defined in the Act, but there are a number of exclusions

- Farming or Fishing
- Logging
- Construction
- Oil and gas operations and processing
- Mineral extraction
- Mineral processing or production
- Electrical or steam generation

Just as it does for the Small Business Deduction, the software prompts the user to enter a single estimate for Active Business Income (exclusive of P2/FINANCE-BC Option income) that covers the current year and years over which the Option will exist. This income is used as the basis for the determination of the amount of income eligible for the M&P Deduction. This estimate of Active Business Income will require some broad assumptions the user should consider. In essence the assumptions are that income from the Option will be not dramatically affect the corporation's effective tax rate as it presently stands, and that Active Business Income will be relatively stable during the life of the Option. Users should make necessary adjustments if they feel these assumptions may mislead the analysis.



If the corporation's gross revenue from business in Canada that can be considered M&P is over the eligibility threshold, the M&P Deduction applies to income generated by M&P activity. P2/FINANCE-BC determines this income as the percentage of projected Active Business Income that is from M&P activity. The user supplies the percentages of its gross revenue and active business income that are derived from M&P and the firm's total active business income.

If the user is eligible for and has opted to take a Small Business Deduction, the income eligible for the M&P Deduction is first reduced by the amount of income eligible for the Small Business Deduction before the second deduction is applied. Income that is eligible for neither deduction is taxed at the full default rate.

Users interested in more detail regarding the M&P Deduction are encouraged to consult the following sources.

1. Revenue Canada, T2 Corporation Income Tax Guide, 1995, Page 42
2. CCH, Preparing Your Corporate Income Tax Returns, 1996, Page 312.

Corporation Capital Tax (CCT)

British Columbia's Corporation Capital Tax (CCT) is a 0.3% tax levied on the taxable capital of corporations that have capital in excess of C$1.5 million. Financial institutions pay a different rate (1-3%) depending on size. Once taxable capital (technically BC Net Paid Up Capital) exceeds $1.5 million, tax is payable on the full taxable capital, subject to various notch provisions. (The tax rate and various thresholds mentioned in this paragraph are those that were in effect in British Columbia in 1996.)

Taxable capital is the sum of the corporation's equity and capital indebtedness, less an allowance for its loans receivable and investments, and there are several layers of complexity in finally arriving at the BC portion of a corporation's "Net Paid Up Capital", the basis upon which CCT is calculated. Total paid up capital must be calculated, then net paid up capital, then adjusted paid up capital allowing for notch provisions (notch provi-

sions phase the tax in slowly after $1.5 million), then eligible expenditures are deducted from CCT payable.

CCT is deductible from income taxes so it is treated the same as any other operating cost and subtracted (deducted) from income prior to the taxable-income calculation.

When considering the inclusion of CCT in an analysis, you should think of it in terms of the extent to which the Option affects the firm's net paid up capital. If there is a significant effect, you should include it to better reflect the true costs and cost savings of the Option.

Users interested in more detail regarding CCT are encouraged to consult the following sources.

1. Province of British Columbia, Guide for Completion of the Corporation Capital Tax General Return
2. Province of British Columbia, Corporation Capital Tax Schedules A through H and General Return
3. CCH, Preparing Your Corporate Tax Returns, 1996, 16th Edition, Pages 617-649

Large Corporations Tax (LCT)

Large Corporations Tax (LCT) is a special tax (at the rate of 0.225%) on a corporation's taxable capital in excess of C$10 million. In the case of related corporations, the C$10 million must be allocated among the associated group of corporations. The effective rate of .225% is multiplied by taxable capital employed in Canada greater than C$10,000,000 to arrive at Gross Tax Payable. (The tax rate and threshold mentioned in this paragraph are those that were in effect in Canada in 1996. Users are strongly encouraged to verify these values are still valid.)

LCT is not deductible from income taxes so it is added back to income (not deducted from revenue) prior to the taxable-income calculation.

When considering the inclusion of LCT in an analysis, you should think of it in terms of the extent to which the Option affects the firm's taxable capital. If there is a significant effect, you should include it to better reflect the true costs and cost savings of the Option. Note that a Federal Income surtax can be applied to reduce LCT. If your firm's income is relatively high, LCT might be decreased or eliminated.

Users interested in more detail regarding LCT are encouraged to consult the following source.

- CCH, Preparing Your Corporate Tax Returns, 1996, 16th Edition, Pages 393 - 400

Appendix C: Capital Cost Allowance (CCA) Information

A corporation may deduct part of the capital cost of a depreciable property from income it earned in a given year. This deduction is referred to as Capital Cost Allowance (CCA). Depreciating an asset via the CCA is a means of distributing its cost over the years in which it is used. The CCA is considered a cost that is subtracted from gross profit in order to calculate pre-tax profit. Thus, the higher the CCA, the lower the taxable income and the lower the tax you have to pay. Lower taxes paid mean higher cash flows and higher investment profitability. It is therefore important to optimise the CCA of your assets within the constraints of the tax code.

The maximum CCA available in a given year need not be claimed in that year and may instead be spread across other taxation years when the benefit is greater. Firms may choose to directly expense some initial investment costs (e.g., pre-production and deferred development costs, site investigation, and start-up) in the initial investment year. Expensed means that the entire cost of the asset will be charged in the first year of the investment. Working capital costs cannot be depreciated because they are recovered at the end of the lifetime of the Option. All other capital costs will be depreciated in the way you specify in the program. The way you choose to depreciate your equipment will be governed by Revenue Canada rules. Within these rules, to maximise profitability you should choose the method that provides you with the highest present value of tax deductions (i.e., you should accelerate your CCA to the extent allowed by law, and/or defer it to years when there is no tax payable). Some pollution prevention and pollution control equipment may be eligible for an Accelerated Capital Cost Allowance.

Users interested in more detail regarding CCA are encouraged to consult the following sources.

1. Revenue Canada, T2 Corporation Income Tax Guide, 1995, Pages 28 - 32
2. CCH, Preparing Your Corporate Tax Returns, 1996, 16th Edition, Pages 162-234.

CCA Methods

P2/FINANCE-BC offers three different CCA methods for you to choose from. The first two methods use a half-year convention, whereby only half the value of the first year's CCA is used in the first year. The reason for using this convention is that assets are bought at different times throughout the year. The half-year rule assumes that, on average, assets are bought halfway through the year. For the first two CCA methods, P2/FINANCE-BC does not claim CCA in the year an asset is sold.

1. **Declining Balance (DB)** - This is the most common method for computing CCA. Using a declining balance method, the asset depreciates faster at the beginning of its life. The CCA class to which the equipment belongs determines the rate at which it is depreciated. Each year, the undepreciated capital cost (UCC) of the asset is reduced by that rate (although, in the first year, only half the CCA can be claimed).
2. **Straight Line (SL)** - Using straight line CCA, the asset cost is evenly spread over the useful life (as determined by Revenue Canada) of the asset. This method is less common but is used in situations such as leaseholds and for Accelerated Capital Cost Allowance (ACCA). Each year, the undepreciated capital cost (UCC) of the asset is

reduced by a fixed amount (although, in the first year, again, only half the CCA can be claimed).

3. **Enter Each Year's CCA (EY)** - This method allows you to enter directly the percentage of total depreciable costs when you know the yearly pattern to be irregular. When you manually enter each year's depreciation, P2/FINANCE-BC does not apply the half-year rule, and it does allow you to claim CCA in the year of sale. This method is designed you give you total flexibility; the software will depreciate the asset by the exact percentage you specify. Please note that the aggregate percentage of CCA depreciation over the life of the asset cannot exceed 100%.

Using the declining-balance method, which is the more standard method, the maximum rate is applied to the undepreciated capital cost (UCC) of the class at year end to determine the maximum CCA. For some property (e.g., pollution control equipment) a straight line method may be used. Normally assets are pooled by asset-class and in practice, a given purchase (after deducting CCA) will be added to the UCC of the relevant class at the end of the year. P2/FINANCE-BC will employ similar concepts but will assume that each asset constitutes its own class. Therefore the calculation is performed as if the class were empty when the asset is purchased and empty again once the asset is sold.

This simplification removes the need for the user, and the software, to keep track of, and forecast, asset activity throughout the company. This simplification may also accelerate the write-off in cases where the pool is sure to have other assets in it AND a large terminal loss is expected. If users are concerned about the accelerated write-off they should make an adjustment (i.e., an adjustment to gradually incur or delay the terminal loss).

Accelerated Capital Cost Allowance

ACCA is a special CCA provision (class 24 or 27) that allows pollution control and pollution prevention equipment to be depreciated at an accelerated rate. Following successful application to Environment Canada, equipment may be written off in 3 years (25% in the first year, 50% in the second year and 25% in the third year).

Two key eligibility criteria are difficult to predict: First, whether it abates pollution and second, whether it is deemed to specifically address pollution (rather than a being pure efficiency measure). Two other criteria are less ambiguous. First, the pollution problem must have been established before 1974 and second, control expenditures must be incurred before Dec. 31, 1998.

Pre authorisation is available from Environment Canada. This would remove ambiguity and be justified on Options that are close. However, most cases will be clearly in or out (and mostly out) based on the timing criterion.

Users seeking more information regarding ACCA should contact Environment Canada, Ottawa, Ontario, K1A 0H3 (819) 997-2057.

Offset Period

Revenue Canada also regulates when CCA should begin. The *available-for-use* rule specifies the earliest year in which a corporation can claim CCA. Buildings, for example, may only generate CCA when the building is complete or when the corporation uses substantially all of the building for its intended use. Because for the analysis we assume an

investment occurs at the end of a year, P2/FINANCE-BC assumes that the equipment is placed into service in the following year. For example, if the investment occurs at the end of Year 0, CCA begins in Year 1.

Note: Revenue Canada uses the term "year" to indicate fiscal year, not calendar year.

In most cases a firm purchases a piece of equipment and makes it ready for use almost immediately. However, in some cases there may be a delay between purchase and making the equipment available for use. If a company purchases a press at the end of Year 0, but does not install it until the end of Year 1 because of construction delays, the company may not be allowed to begin depreciating it until Year 2. This delay is called the offset period in the software. P2/FINANCE-BC allows you to choose an offset period (in years). In the example described above, the offset period would be one year.

CCA Classes, Descriptions, and Rates

The CCA class to which the capital investment equipment belongs determines the maximum rate at which it can be depreciated. As shown on the following pages, each class has a corresponding rate. To determine the appropriate rate to use, simply find the equipment class, and use the rate shown. (Please note that this table contains information that was prevalent in Canada in 1996. Users of the software in subsequent years are strongly urged to verify this information, as it may be subject to change.)

Class	Description	Rate
1	Most buildings made of brick, stone or cement, acquired after 1987, including their component parts such as electric wiring, lighting, fixtures, plumbing, heating and cooling equipment, elevators and escalators	4%
2	Electrical generating equipment, a pipeline and various other distributing equipment acquired before 1988.	6%
3	Most buildings made of brick, stone or cement acquired before 1988, including their component parts as listed in class 1 above	5%
6	Buildings made of frame, log, stucco on frame, galvanised iron, or corrugated metal that are used in the business of farming or fishing, or that have no footings below-ground; fences and most greenhouses	10%
7	Canoes, boats and most other vessels including their furniture, fittings or equipment	15%
8	Property that is not included in any other class such as furniture, calculators and cash registers, photocopy and fax machines, printers, display fixtures, refrigeration equipment, machinery, tools costing $200 or more, and outdoor advertising bill-boards, and greenhouses with rigid frames and plastic covers acquired after 1987	20%
9	Aircraft, including furniture, fittings, or equipment attached, and their spare parts	25%
10	Automobiles (except taxis and others used for lease or rent), vans, wagons, trucks, buses, tractors, trailers, drive-in theatres, general-purpose electronic data-processing equipment (e.g., personal computers) and systems, software, and timber cutting and removing equipment	30%
10.1	Passenger vehicles costing more than $24,000 ($20,000 if acquired before September 1989). For passenger vehicles acquired after 1990, the $24,000 cost does not include either GST or any provincial sales tax	30%
12	Chinaware, cutlery, linen, uniforms, dies, jigs, moulds or lasts, computer software, (except systems software), cutting or shaping parts of a machine, certain property used for earning rental income such as apparel or costumes, and videotape cassettes; certain property, costing less than $200 such as kitchen utensils, tools, and medical or dental equipment; certain property acquired after August 8, 1989, and before 1993 for use in a business of selling or providing services such as electronic bar-code scanners, and cash registers used to record multiple sales taxes	100%
13	Property that is a leasehold interest (the maximum CCA rate depends on the type of the leasehold and the terms of the lease). Annual CCA for this class requires a calculation of one or more "prorated portions." The prorated portion is the lesser of a) one-fifth of the unit of capital cost, and b) the amount determined by dividing the unit of capital cost by the number of 12 month periods (not exceeding 40) falling within the period in which the capital cost was incurred and ending with the day the lease is to terminate. The termination date falls at the end of the lease plus the first possible renewal term. For further information and a detailed example, reference should be made to Interpretation Bulletin IT-464R.	n/a
14	Patents, franchises, concessions and licences that have a limited life—the CCA is limited to the lesser of the capital cost of the property spread out over the life of the property; and the undepreciated capital cost of the property at the end of the taxation year. Class 14 assets are not subject to the half-year rule, however Revenue Canada requires the CCA available to be apportioned on a per diem basis in any given taxation year. Class 14 also includes patents and licences to use patents for a limited period that you elect not to include in class 44	n/a

Class	Description	Rate
16	Automobiles for lease or rent, taxicabs and coin-operated video games or pinball machines; certain tractors and large trucks acquired after December 6, 1991, that are used to haul freight and that weigh more than 11,788 kilograms	40%
17	Roads, sidewalks, parking-lot or storage areas, telephone, telegraph, or non-electronic data, communication switching equipment	8%
24	Please refer to the Accelerated Capital Cost Acceptance discussion	50%
27	Please refer to the Accelerated Capital Cost Acceptance discussion	50%
38	Most power-operated movable equipment acquired after 1987 used for moving, excavating, placing or compacting earth, rock, concrete or asphalt	30%
39	Machinery and equipment acquired after 1987 that is used in Canada primarily to manufacture and process goods for sale or lease	25%
43	Manufacturing and processing machinery and equipment acquired after February 25 1992, described in class 39 above. Note that this class may be specifically applicable for some energy conservation and non-product output treatment investments. (See CCH, *Preparing Your Corporate Tax Returns, 1996, 16th edition,* pages 224-226 for further discussion.)	30%
44	Patents and licenses to use patents for a limited or unlimited period that the corporation acquired after April 26, 1993. However, you can elect not to include such property in class 44 by attaching a letter to the return for the year the corporation acquired the property. In the letter indicate the property you do not want to include in class 44	25%

The foregoing is adapted directly from the *Revenue Canada, T2 Corporation Income Tax Guide, 1995*. For a more detailed discussion of each class, please refer to *CCH, Preparing Your Corporate Tax Returns, 1996, 16th Edition.*