

## INVESTMENT ANALYSIS MONTHLY EXAMPLE WITH REVENUE & EXPENSES PROJECTIONS

### Canadian Example

Including application of Incremental Cash Flow Analysis

### INTRODUCTION

This is an investment analysis example where the investment generates revenues and incurs expenses, which are projected monthly in order to establish the monthly cash flows. It also illustrates the application of incremental cash flow analysis.

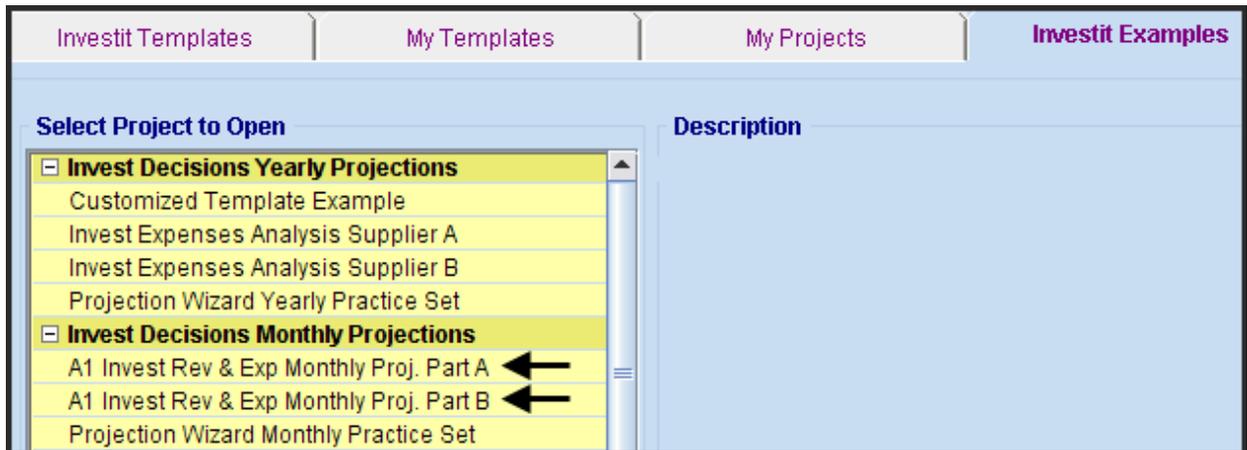
This example is for manufacturing but the analysis applies to profit and non profit organizations such as government, universities, hospitals and service industries. Any situation where;

1. An investment is made in plant, equipment or facilities to produce the product or service or to create cost savings.
2. The investment generates revenues from the sale of products or for the delivery of services.
3. Operating expenses are incurred for labor, materials, utilities, insurance, increased overhead etc.

### VERIFYING YOUR ANALYSIS

You can compare your analysis against the two Investit Examples;

1. Invest Rev & Exp Monthly Proj. Part A
2. Invest Rev & Exp Monthly Proj. Part B



### EXAMPLE

An organization is considering expanding their production facilities to generate more sales revenue.

#### OPTION A.

The organization can spend \$11,000,000 to expand their New Jersey plant to increase the production and sales of Product A & B. What is their return on investment and is it acceptable?

#### OPTION B.

For \$15,000,000 they can also add a new product called Product Z. In addition, if they spend \$15,000,000 they can lower the unit cost of producing products A and B resulting in additional savings.

**The organizations minimum acceptable Internal Rate of Return (IRR)**

The organizations minimum acceptable rate of return using the Internal Rate of Return is 12.00% (Before Tax). If the investment doesn't provide a return (IRR) of at least 12.00% it should be rejected.

**The decision**

Should the organization invest \$11,000,000 or \$15,000,000? This question is answered using incremental cash flow analysis. The steps are;

1. Enter the information for the \$11,000,000 investment and save the project
2. Using "Save As" create a second copy of the \$11,000,000 analysis with a new project name
3. Modify the copy of the \$11,000,000 analysis to create the \$15,000,000 analysis and save
4. Use the "Incremental Cash Flow Report" to compare the two options and to decide;
  - a) Is the financial return on the \$11,000,000 plant expansion acceptable?
  - b) If the \$11,000,000 investment is acceptable, can the \$15,000,000 investment be justified?
  - c) What is the financial return on the additional \$4,000,000? Is it acceptable?

This is an example of "**Mutually Exclusive Investments**" The organization can;

1. Do nothing
2. Invest \$11,000,000 to increase the sales of Product A & B or
3. Invest \$15,000,000 to increase the sales of Products A & B and add product Z.

They can only choose one of the options.

## **OPTION A Should the \$11,000,000 be invested?**

### **Project Info Folder**

Project Name: Hamilton \$11M Expansion  
Project Description: Increased production for Product's A & B  
Analysis Period: 10 Years  
Analysis Start Date: March 2010

### **Investor Folder**

Marginal Tax Rate 33.00%  
% of Capital Gain: 50.00%  
Desired Return or Discount Rate (Before Tax): 12.00%  
Short Term Rates for calculating the Modified Internal Rate of Return (MIRR)  
Short Term Financing Rate (Before Tax): 7.00%  
Short Term Reinvestment Rate (Before Tax): 2.50%

### **Investment Folder**

Plant Expansion: \$11,000,000 Year 2010 March  
CCA Rate: 30.00%

### **Working Capital Folder**

Working Capital: \$200,000 Year 2010 March

### **Expenses Folder**

**Labor:** \$60,000 per month for 12 months then increasing at 2.00% per year compounding for 2 years then 3.00% compounding per year  
**Materials:** 40.00% of Revenues  
**Repairs & Maintenance:** \$20,000 per Month for 12 months then increasing at 3.00% compounding per year  
**Utilities:** \$3,000 per month for 12 months then increasing at 4.00% compounding per year  
**Marketing and Sales Fixed Cost:** \$60,000 per month for 12 months then increasing at 4.00% per year compounding  
**Sales commission:** 20.00% of revenue

### **Revenue Folder**

The new facilities produce two product versions. Product A and B. Projected pricing and sales are;

#### **Product A**

**Price:** Year 1. \$3,000 per Unit for the first 12 months then increasing at 3.00% per year compounding

**Quantity (Sales per Month):**

Year 2010: 100 per month.

Year 2011: 150 per month then increasing at 6.00% per year compounding

#### **Product B**

**Price:** Year 1. \$4,500 per unit increasing at 4.00% per year compounding

**Quantity (Sales per Month):**

Year 2010: 50 per month for 12 months then increasing at 3.00% per year compounding for 2 years then 5.00% compounding per year

### **Financing Folder**

The organization's bank approved the following loan to fund the expansion.

Start Date: March 2010

Type: Standard Mortgage

Amount: \$3,000,000

Time Period: 7 years

Amortization Period: 7 years

Interest Rate: 7.00% per year

Payments: Monthly

Compounding Period: Monthly

### **Salvage Value Folder**

Salvage Value: \$300,000

Disposition Costs: 10.00% of Salvage Value

**OPTION B Should \$15,000,000 be invested?**

Create a second version of the \$11,000,000 investment using "Save As" and make the following changes

**Project Info Folder**

Project Name: Change to "Hamilton \$15M Expansion"

Project Description: Change to "Production for Product's A, B & Z"

**Investor Folder**

No change

**Investment Folder**

Investment: Change to \$15,000,000

**Working Capital Folder**

**Working Capital:** Change to \$260,000

**Revenue Folder**

**Important Note:**

Make the changes to the Revenue Folder before making the changes to the Expenses folder

Why? Because the "Materials" and "Sales Commission" expenses are a "% of the Revenue(s) for Products A, B & Z

The new facilities produce three product versions. Projected pricing and sales are:

**Product A**

No change

**Product B**

No change

**Product Z**

Add the information for the product Z

**Price:** Year 1. \$2,100 per Unit increasing at 4.00% per year compounding

**Quantity (Sales per Month):**

Year 2010: 35 per month then increasing at 7.00% per year compounding

**Expenses Folder**

**Labor:** Change from \$60,000 to \$80,000 per Month for 12 months then increasing at 2.00% per year compounding" for 2 years then 3.00% compounding per year

**Materials:**

Change from 40.00% to 37.00% of Revenues

Change the "% of Revenue(s)" from 40.00% of the revenue for Product A & B to 37.00% of Products A, B and Z

**Notes:**

Material costs have been reduced from 40.00% to 37.00% of sales because of economies of scale

**Repairs & Maintenance:** Change from \$20,000 per month to \$25,000 per Month for 12 months then increasing at 3.00% compounding per year

**Utilities:** Change to \$3,700 per month for 12 months then increasing at 4.00% compounding per year  
**Marketing and Sales Fixed Cost:** Change from \$60,000 to \$70,000 per Month for 12 months then increasing at 4.00% per year compounding

**Sales commission:**

20.00% of revenue. No change

Change the "% of Revenue(s)" from 20.00% of the revenue for Product A & B to 20.00% of Products A, B and Z

**Financing Folder**

No change

**Salvage Value Folder**

Salvage Value: Change to \$400,000

## INSTRUCTIONS FOR ENTERING THE PROJECT

### Template selection

The selection of the appropriate template is based on the following;

1. The analysis involves revenue and expenses
2. Projections are Monthly in order to establish the monthly cash flows
3. Use the “Project Comparison Report” or the “Incremental Cash Flow Report” to compare the two options

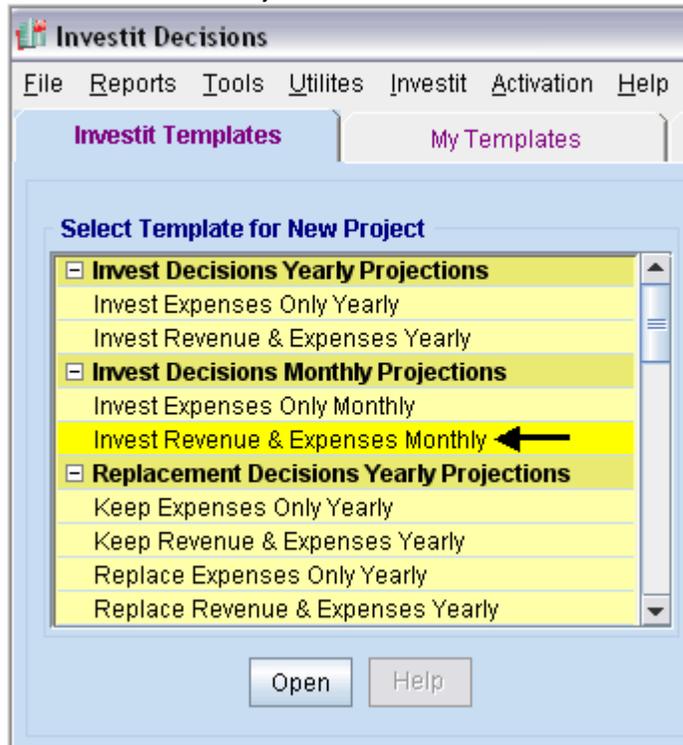
Template: Invest Revenue & Expenses Monthly projections

## INSTRUCTIONS FOR ENTERING OPTION A: \$11,000,000 EXPANSION

### Getting started

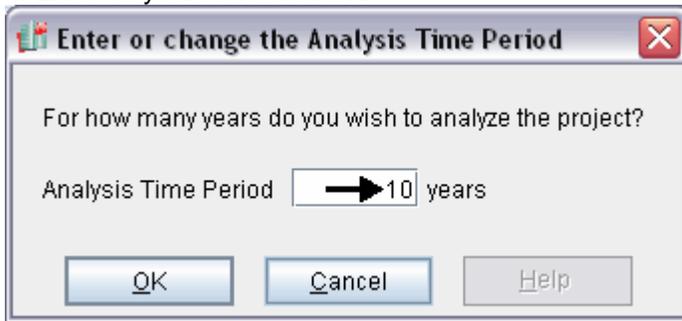
The first step is to open the Investit Template “Invest Revenue & Expenses Monthly” as follows:

1. Open Investit Decisions.
2. Select the New Project Folder then select the Investit Templates folder



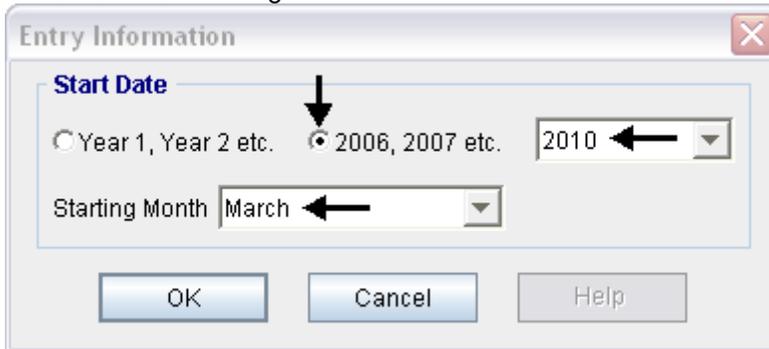
3. Select and open the Investit template “Invest Revenue & Expenses Monthly”. The analysis period dialog will open at this point.

4. Enter 10 years and click OK



### Project Info Folder

1. Enter the Project Name: Hamilton \$11M Expansion
2. Enter Description: Increased production for Product's A & B
3. Enter Purchase Price: \$11,000,000
4. Click on the **Change Entry Information** button. A dialog window will pop up.
5. Select the following



Your entries in the Project Info folder should look like this;

Project Info.	Investor	Investment	Working Capital	Expenses
<b>Report Headers</b>				
Project Name	Hamilton \$11M Expansion ←			
Project Description	Increased production for Product's A & B ←			
<b>Analysis Time Period</b>				
10	Years	Change Analysis Time Period		
<b>Entry Information</b>				
Enter Revenue and Expenses	Monthly	Change Entry Information		
Starting Date	March 2010			

### Investor Folder

1. Enter Investor's Marginal Tax Rate: 33.00%
2. Enter the Discount Rate Before Tax: 12.00%  
Notes: The Discount Rate is used to calculate the Net Present Value and Net Effective Rent  
The program automatically calculates the Discount Rate After Tax
3. Enter Short Term Rates Before Tax  
Financing Rate: 7.00%  
Reinvestment Rate: 2.50%

The investor folder should look like this;

Project Info.	Investor	Investment	Working Capital	Expenses	Revenue
<input type="checkbox"/> Turn off Tax Calculations					
Investor's Marginal Tax Rate		→ 33.00%			
<b>Tax Calculation on Sale based on</b>					
<input checked="" type="radio"/> Percentage of Capital Gain		50.00%			
<input type="radio"/> Income Tax					
<b>Discount Rate or Desired Return on Investment</b>					
Before Tax		→ 12.00%			
After Tax		7.80%			
<b>Short Term Rates</b>					
<b>Before Tax</b>					
Financing Rate		→ 7.000%			
Reinvestment Rate		→ 2.500%			
<b>After Tax</b>					
Financing Rate		4.550%			
Reinvestment Rate		1.625%			

**Investment Folder**

Investment: \$11,000,000 Year 2010 March

Depreciation: 200% Declining Balance. Recovery Period: 7 years

The Investment folder should appear like this;

Project Info.	Investor	<b>Investment</b>	Working Capital	Expenses	Revenue	Financing
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CCA Claim Option: Full CCA Claim

**Investments**

Inflate

Description	Amount	Year	Month	CCA Class	CCA Rate	First Year	Claim CCA in Last Year
Land	\$ 0	2010	Mar	Land			
Building	\$ 0	2010	Mar	Building	4.00%	50.00%	<input checked="" type="checkbox"/>
Equipment & Machinery	\$ 0	2010	Mar	Equipment/Machinery	30.00%	50.00%	<input checked="" type="checkbox"/>

1. Individually Delete rows 'Land' and 'Building' by selecting the row and clicking on the "Delete" button.
2. Change 'Equipment & Machinery' to 'Plant Expansion'
3. Complete the folder as follows

The Investment folder should now look like this;

Project Info.	Investor	<b>Investment</b>	Working Capital	Expenses	Revenue
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CCA Claim Option: Full CCA Claim

**Investments**

Inflate

Description	Amount	Year	Month	CCA Class	CCA Rate	First Year	Claim CCA in Last Year
Plant Expansion	\$ 11,000,000	2010	Mar	Equipment/Machinery	30.00%	50.00%	<input checked="" type="checkbox"/>

**Working Capital Folder**

Working Capital: \$200,000 Year 2010 March

1. Enter \$200,000 directly into the grid for 2010 March

The Working Capital folder should look like this;

Project Info.	Investor	Investment	<b>Working Capital</b>	Expenses	Revenue
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**Working Capital**

Description	Entry Choice	2010 Mar...	2010 Apr...
Working Capital	Add or Subtract (-) Working Capital	\$ 200,000	\$ 0

**Expenses Folder**

**Labor:** \$60,000 per month for 12 months then increasing at 2.00% per year compounding for 2 years then 3.00% compounding per year

**Materials:** 40.00% of Revenues

**Repairs & Maintenance:** \$20,000 per month for 12 months then increasing at 3.00% compounding per year

**Utilities:** \$3,000 per month for 12 months then increasing at 4.00% compounding per year

**Marketing & Sales Fixed Cost:** \$60,000 per month for 12 months then increasing at 4.00% per year compounding

**Sales commissions:** 20.00% of revenue

The expenses folder should look like this;

Project Info.	Investor	Investment	Working Capital	Expenses	
<b>Expenses</b>					
Description	Entry Choice	Qty	Category	2010 Mar...	
Labor	\$ per Mo	—	Common	\$ 0	
Materials	\$ per Mo	—	Common	\$ 0	
Repairs & Maintenance	\$ per Mo	—	Common	\$ 0	
Utilities	\$ per Mo	—	Common	\$ 0	
Insurance	\$ per Mo	—	Common	\$ 0	
Incremental Overhead	\$ per Mo	—	Common	\$ 0	
Rent	\$ per Sq. Ft per Yr	0	Common	\$ 0.00	

Steps for setting up the folder

1. Select row 2 'Materials'
2. Select the entry choice '% of Revenues'. The % of Revenue window will pop up. There will only be one option available check it and Press OK. We will have to return here after we set up the Revenue folder.
3. Select row with description 'Insurance'
4. Enter description 'Marketing & Sales Fixed Costs'
5. Select row with description 'Incremental Overhead'
6. Enter description 'Sales Commissions'.
7. Select entry choice '% of Revenue'. The % of Revenue window will pop up. There will only be one option available check it and Press OK. We will have to return here after we set up the Revenue folder.
8. Select row with description 'Rent'
9. Click on the Delete button

The Expenses folder should now look like this;

Project Info.		Investor	Investment	Working Capital	Expenses
<b>Expenses</b>					
Description	Entry Choice	Qty	Category	2010 Mar...	
Labor	\$ per Mo	—	Common	\$ 0	
Materials	% of Revenue(s)	—	Common	0.00%	
Repairs & Maintenance	\$ per Mo	—	Common	\$ 0	
Utilities	\$ per Mo	—	Common	\$ 0	
Marketing & Sales Fixed Co...	\$ per Mo	—	Common	\$ 0	
Sales Commissions	% of Revenue(s)	—	Common	0.00%	

Entering the Expenses

**Labor:** \$60,000 per month for 12 months then increasing at 2.00% per year compounding for 2 years then 3.00% compounding per year

1. Select row 1 'Labor'
2. Click on the Projection Wizard button and enter the data as follows

**Projection Wizard**

**Entry Information**

Description: Labor  
Entry Choice: \$ per Mo

**Projections**

Paid	Project Entry Using...	Entry	Start Date		Time Period		Increase	Cont. Proj.
			Year	Month	To End	Yrs		
Monthly for 12 Months	Annual Compounding	\$ 60,000.00	2010	Mar	3	0	2.00%	<input checked="" type="checkbox"/>
	Annual Compounding		2013	Mar	7	0	3.00%	<input checked="" type="checkbox"/>

**Projection Description**

Labor  
Entry Choice: \$ per Month  
2010 Mar \$60,000.00 per Month paid monthly for 12 months  
Compounding at 2.00% per year for next 2 years  
then Compounding at 3.00% per year for next 7 years

Buttons: OK, Print Report, Help

Buttons: New Projection, Insert Projection, Delete Projection, Delete All Projections, Projection Description

3. Click OK on the Projection Description window to return to the Projection Wizard
4. Click OK on the Projection Wizard window to save your entries and return to the Expenses folder

**Materials: 40.00% of Revenues**

1. Select row with description 'Materials'
2. Click on the Projection Wizard button and enter the data as follows

The screenshot shows the 'Projection Wizard' window with the following data in the 'Projections' table:

Enter	Project Entry Using...	Select %	Start Date		Time Period			Increase	Cont. Proj.
			Year	Month	To End	Yrs	Mos		
Monthly for 12 Months	Constant (Fill Right)	40.00%	2010	Mar	<input checked="" type="checkbox"/>	10	0		

The 'Projection Description' dialog box displays the following information:

```

Materials
Entry Choice: % of Revenue(s)
Sales Revenue Product A
Sales Revenue Product B
2010 Mar      40.00% of Revenue(s) for 12 months
               Constant per year for next 9 years
    
```

Buttons at the bottom of the wizard include: New Projection, Insert Projection, Delete Projection, Delete All Projections, and Projection Description.

**Repairs & Maintenance:** \$20,000 per month for 12 months then increasing at 3.00% compounding per year.

1. Select row with description 'Repairs & Maintenance'
2. Click on the Projection Wizard button and enter the data as follows

The screenshot shows the 'Projection Wizard' window. The 'Entry Information' section shows 'Description: Repairs & Maintenance' and 'Entry Choice: \$ per Mo'. The 'Projections' section contains a table with the following data:

Paid	Project Entry Using...	Entry	Start Date		Time Period			Increase	Cont. Proj.
			Year	Month	To End	Yrs	Mos		
Monthly for 12 Months	Annual Compounding	\$ 20,000.00	2010	Mar	<input checked="" type="checkbox"/>	10	0	3.00%	

A 'Projection Description' dialog box is open, displaying the following text:

```

Repairs & Maintenance
Entry Choice: $ per Month
2010 Mar      $20,000.00 per Month paid monthly for 12 months
                Compounding at 3.00% per year for next 9 years
    
```

Buttons for 'OK', 'Print Report', and 'Help' are visible in the dialog box. At the bottom of the wizard, there are buttons for 'New Projection', 'Insert Projection', 'Delete Projection', 'Delete All Projections', and 'Projection Description'.

**Utilities:** \$3,000 per month for 12 months then increasing at 4.00% compounding per year

1. Select row with description 'Utilities'
2. Click on the Projection Wizard button and enter the data as follows

**Projection Wizard**

**Entry Information**

Description: Utilities  
Entry Choice: \$ per Mo

**Projections**

Paid	Project Entry Using...	Entry	Start Date		Time Period			Increase	Cont. Proj.
			Year	Month	To End	Yrs	Mos		
Monthly for 12 Months	Annual Compounding	\$ 3,000.00	2010	Mar	<input checked="" type="checkbox"/>	10	0	4.00%	

**Projection Description**

Utilities  
Entry Choice: \$ per Month  
2010 Mar \$3,000.00 per Month paid monthly for 12 months  
Compounding at 4.00% per year for next 9 years

Buttons: OK, Print Report, Help

Buttons: New Projection, Insert Projection, Delete Projection, Delete All Projections, Projection Description

**Marketing & Sales Fixed Cost:** \$60,000 per month for 12 months then increasing at 4.00% per year compounding

1. Select row with description 'Marketing & Sales Fixed Cost'
2. Click on the Projection Wizard button and enter the data as follows

The screenshot displays the 'Projection Wizard' application window. It is divided into two main sections: 'Entry Information' and 'Projections'.

**Entry Information:**

- Description: Marketing & Sales Fixed Costs
- Entry Choice: \$ per Mo

**Projections Table:**

Paid	Project Entry Using...	Entry	Start Date		Time Period			Increase	Cont. Proj.
			Year	Month	To End	Yrs	Mos		
Monthly for 12 Months	Annual Compounding	\$ 60,000.00	2010	Mar	<input checked="" type="checkbox"/>	10	0	4.00%	

Arrows in the image point to the 'Project Entry Using...' dropdown, the 'Entry' field, the 'To End' checkbox, the 'Yrs' field, and the 'Increase' field.

**Projection Description Window:**

This window provides a detailed view of the selected projection:

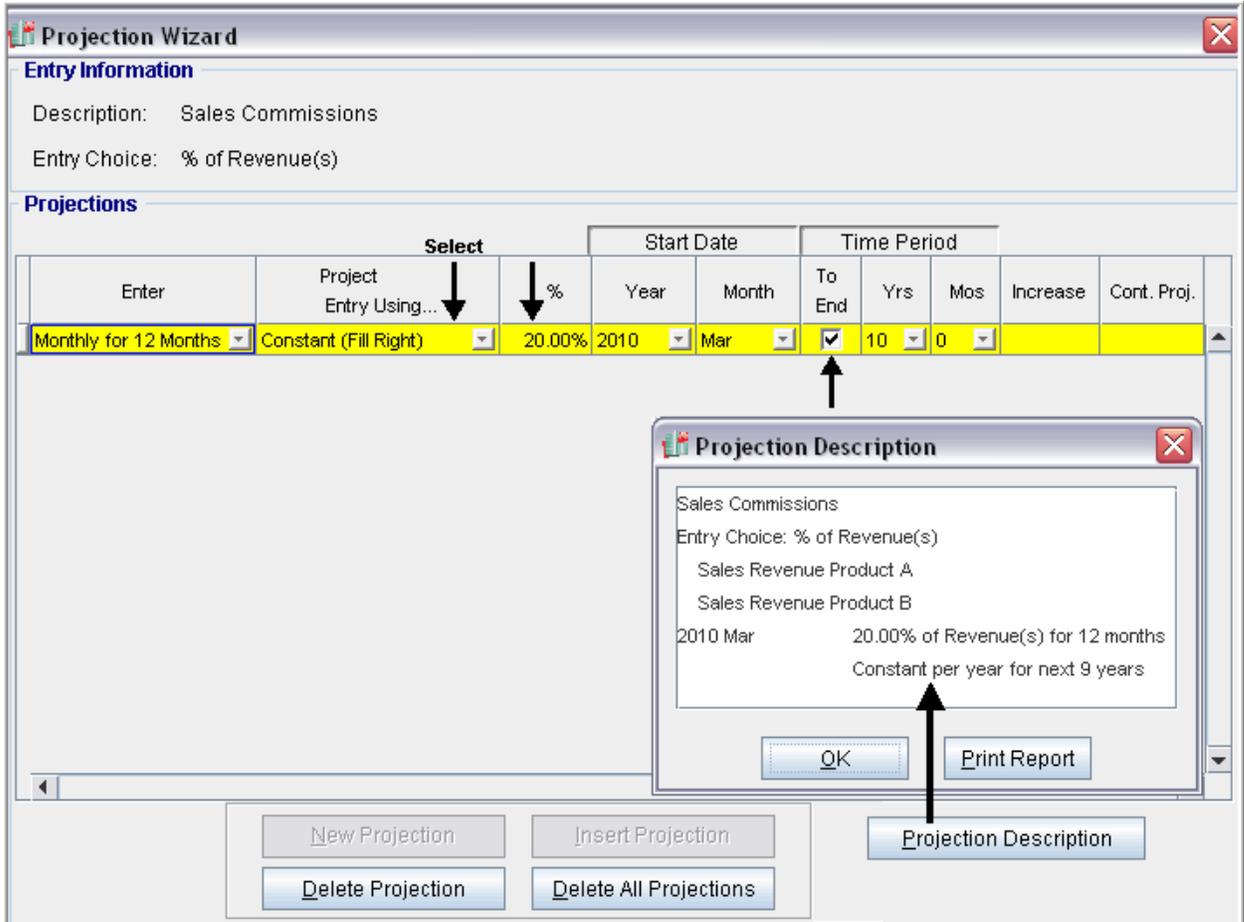
- Marketing & Sales Fixed Costs
- Entry Choice: \$ per Month
- 2010 Mar \$60,000.00 per Month paid monthly for 12 months
- Compounding at 4.00% per year for next 9 years

Buttons at the bottom of the 'Projection Description' window include 'OK', 'Print Report', and 'Help'. An arrow points from the 'Print Report' button back to the 'Projection Description' button in the main wizard window.

At the bottom of the 'Projection Wizard' window, there are several control buttons: 'New Projection', 'Insert Projection', 'Delete Projection', and 'Delete All Projections'. A 'Projection Description' button is also present, which is highlighted by an arrow pointing to the 'Projection Description' window.

**Sales commissions:** 20.00% of revenue

1. Select row with description 'Sales Commissions'
2. Click on the Projection Wizard button and enter the data as follows



Note: The Projection Description will look slightly different before the Revenue folder is set up correctly as Product A and Product B have not been created yet.

## Revenue Folder

### Product A

**Price:** Year 2010: \$3,000 per Unit for the first 12 months then increasing at 3.00% per year compounding

**Quantity (Sales per Month):**

Year 2010: 100 per month.

Year 2011: 150 per month then increasing at 6.00% per year compounding

### Product B

**Price:** Year 2010: \$4,500 per unit for the first 12 months increasing at 4.00% per year compounding

**Quantity (Sales per Month):** Year 2010: 50 per month for 12 months then increasing at 3.00% per year compounding for 2 years then 5.00% compounding per year

Steps for setting up the folder

1. In row 1 enter the Description 'Sales Revenue Product A'

In this example we are using a user defined entry choice. Follow the steps for setting up a user defined entry choice:

Project Info.	Investor	Investment	Working Capital	Expenses	Revenue
<b>Revenue</b>					
Description		Entry Choice	Qty	Category	
Sales Revenue Product A		\$ per Hour and Quantity	—	Common	
		\$ per Yr	—		
		\$ per Mo			
		\$ per Wk			
		\$ per Day			
		Amount			
		\$ per Unit and Quantity			
		\$ per Hour and Quantity			
		% of Revenue(s)			
		% of Expense(s)			
		Edit list... ← <b>Select</b>			

The entry choice list will pop up

**Entry Choice List** ✕

<ul style="list-style-type: none"> <li>\$ per Yr</li> <li>\$ per Mo</li> <li>\$ per Wk</li> <li>\$ per Day</li> <li>Amount</li> <li>\$ per Unit and Quantity</li> <li><b>\$ per Hour and Quantity</b></li> <li>% of Revenue(s)</li> <li>% of Expense(s)</li> </ul>	<p><b>Click</b> → <input type="button" value="Add..."/></p> <input type="button" value="Edit..."/> <input type="button" value="Delete"/> <input type="button" value="Move Down"/> <input type="button" value="Move Up"/> <input type="button" value="Programmed EC:"/>
<input type="button" value="OK"/> <input type="button" value="Cancel"/> <input type="button" value="Help"/>	

The screenshot shows the 'Add Entry Choice' dialog box. At the top right, there are two radio buttons: 'Time Period' (unselected) and 'No Time Period' (unselected). Below them, there are two radio buttons: 'and Quantity' (selected) and 'Quantity' (unselected). In the center, there is a dropdown menu set to 'User Defined' with an arrow pointing to the 'and Quantity' radio button. Below the dropdown is a text field containing '\$' followed by a small input box, 'per', another text field containing 'Unit Product A' with an arrow pointing to it, 'and', and a final text field containing 'Quantity'. Below this, there are two radio buttons: 'Enter using Dollars & Cents' (unselected) with 'Eq. \$754.35' next to it, and 'Enter using only Dollars' (selected) with 'Eq. \$754' next to it. Below these is a 'Preview' section with a text box containing '\$ per Unit Product A and Quantity'. At the bottom are three buttons: 'OK', 'Cancel', and 'Help'.

2. Select the entry choice you have just created
3. Press the ADD button to create a new row for Product B
4. Enter the Description 'Sales Revenue Product B'  
Product B also has its own user defined entry choice. Follow the same steps you did to create the entry choice for Product A.

Enter the following into the Add Entry Choice Menu:

This screenshot is identical in layout to the previous one, but the text field in the center now contains 'Unit Product B' instead of 'Unit Product A'. The 'Preview' section also shows '\$ per Unit Product B and Quantity'.

**Product A**

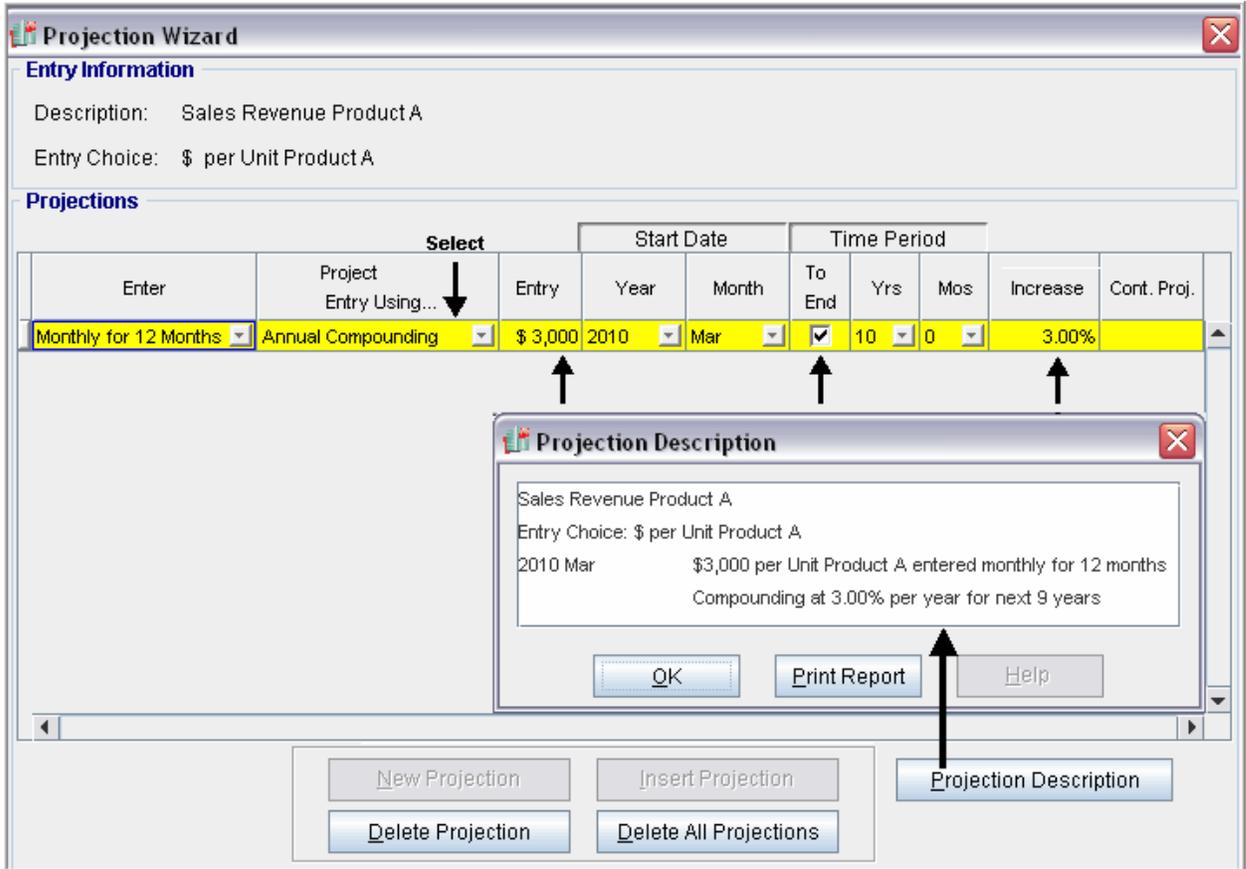
**Price:** Year 2010: \$3,000 per Unit for the first 12 months then increasing at 3.00% per year compounding

**Quantity (Sales per Month):**

Year 2010: 100 per month.

Year 2011: 150 per month then increasing at 6.00% per year compounding

1. Select the row with the Description 'Sales Revenue Product A' and click on the Projection Wizard button.
2. Enter the following entries into the Projection Wizard



3. Select row 2 and click on the Projection Wizard to enter the Quantity for Product A
4. Enter the following entries into the Projection Wizard

**Projection Wizard**

**Entry Information**

Description: Sales Revenue Product A  
Entry Choice: Quantity

**Projections**

Enter	Project Entry Using...	Entry	Start Date		Time Period			Increase	Cont. Proj.
			Year	Month	To End	Yrs	Mos		
Monthly for 12 Months	Annual Compounding	100	2010	Mar	1	0	6.00%	<input type="checkbox"/>	
Monthly for 12 Months	Annual Compounding	150	2011	Mar	<input checked="" type="checkbox"/>	9	0	6.00%	

Enter the data into row 1 and then click on the New Projection button then enter the data for row 2.

**Projection Description**

Sales Revenue Product A  
Entry Choice: Quantity  
2010 Mar 100 entered monthly for 12 months  
2011 Mar 150 entered monthly for 12 months  
Compounding at 6.00% per year for next 8 years

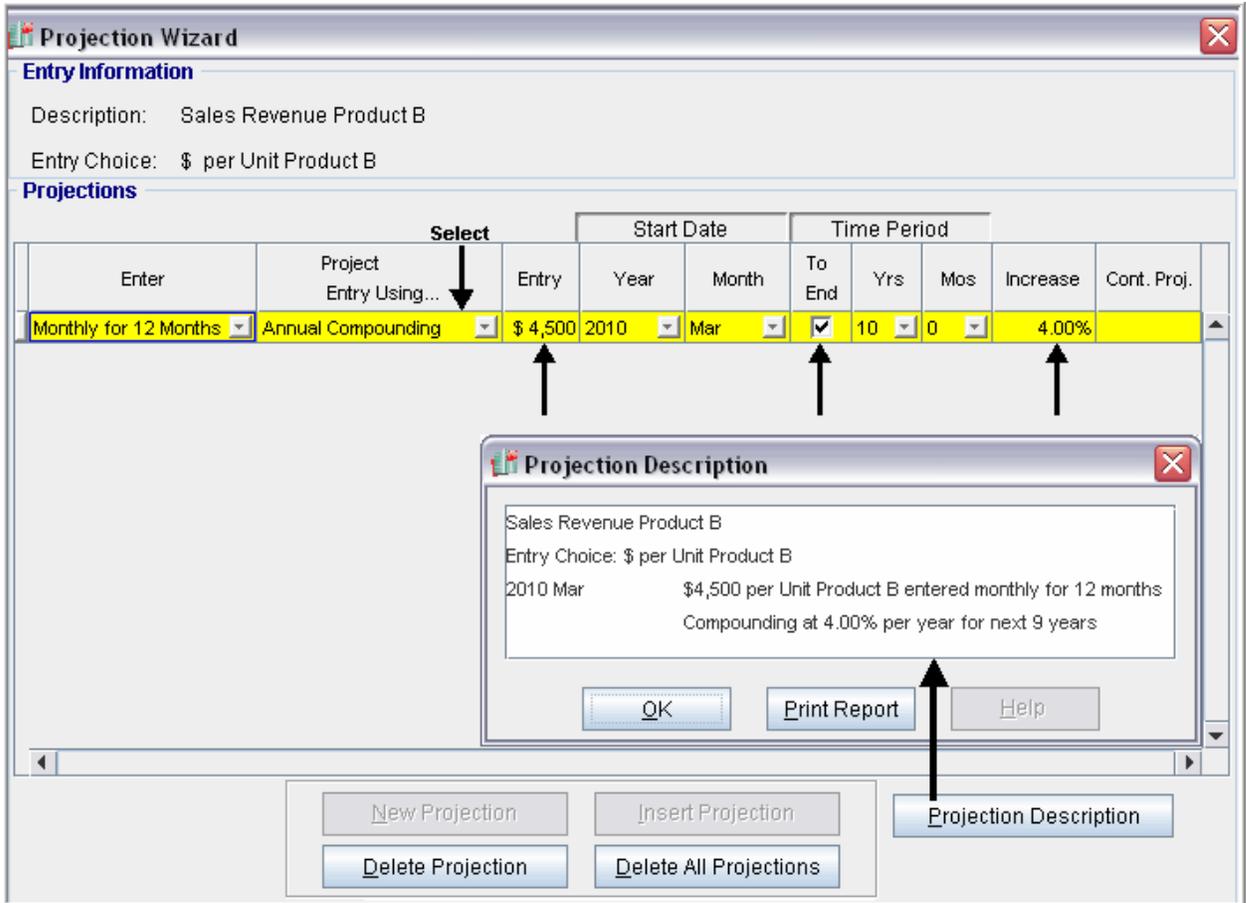
Buttons: OK, Print Report, Help

Buttons: New Projection, Insert Projection, Delete Projection, Delete All Projections, Projection Description

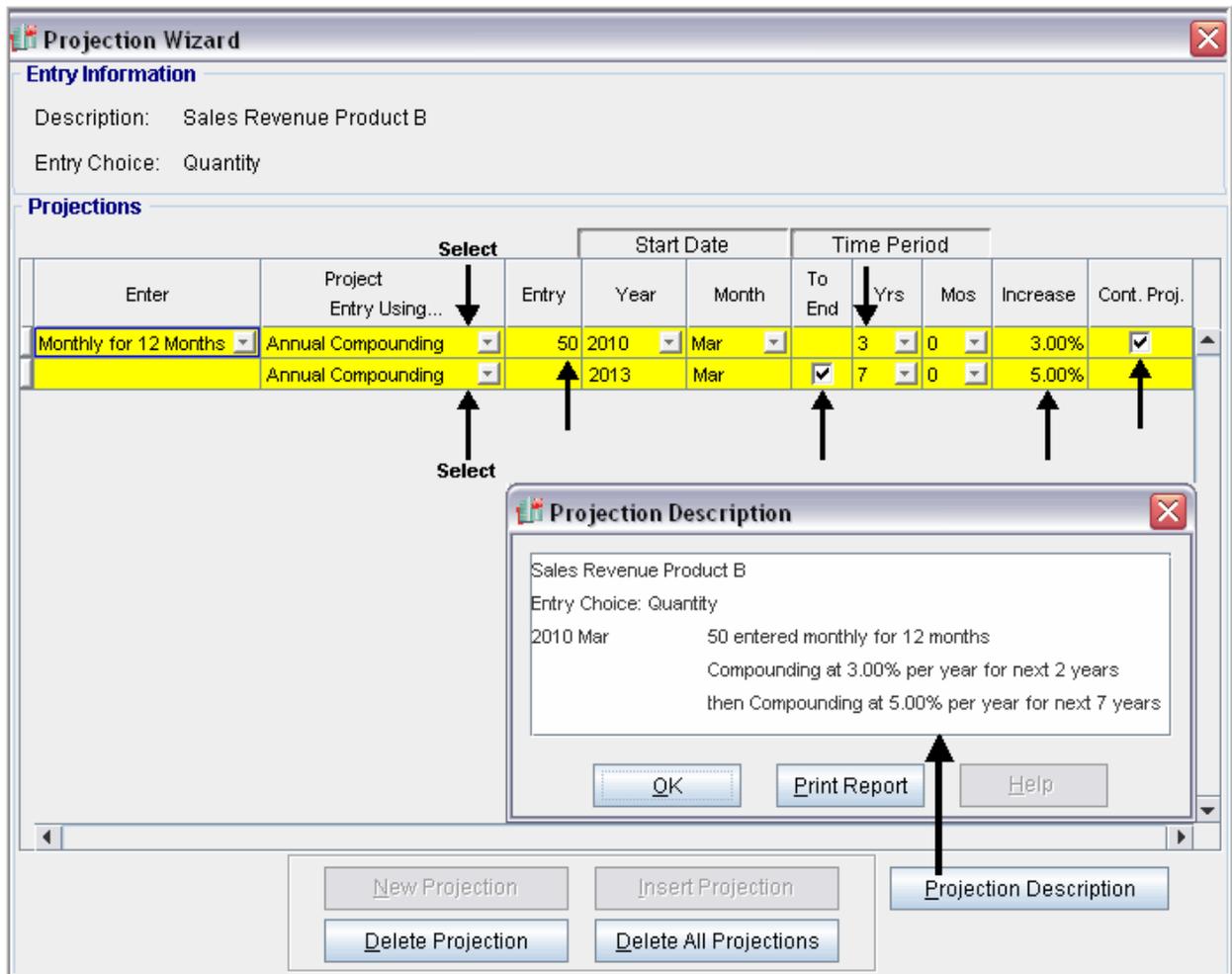
**Product B**

**Price:** Year 2010: \$4,500 per unit for the first 12 months increasing at 4.00% per year compounding  
**Quantity (Sales per Month):** Year 2010: 50 per month for 12 months then increasing at 3.00% per year compounding for 2 years then 5.00% compounding per year

1. Select the row with the Description 'Sales Revenue Product B' and click on the Projection Wizard button.
2. Enter the following entries into the Projection Wizard



3. Select row 4 and click on the Projection Wizard to enter the Quantity for Product B
4. Enter the following entries into the Projection Wizard



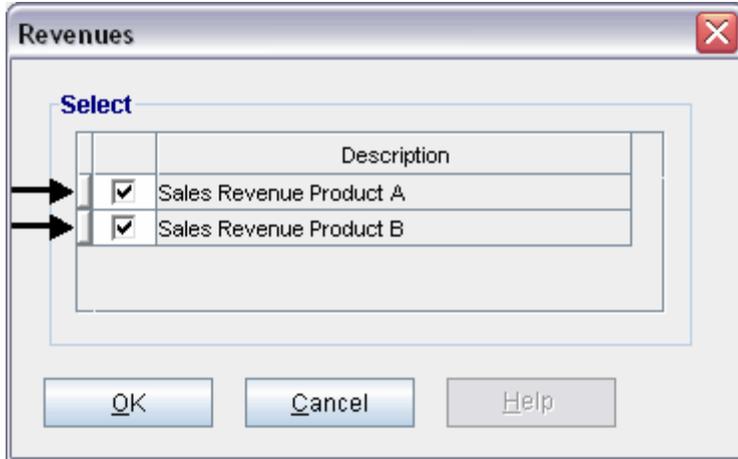
## Expenses Folder

Now that the Revenues have been entered the expenses that used the entry choice '% of Revenues' need to be revisited. This is why for Project B we will update the Revenue folder first.

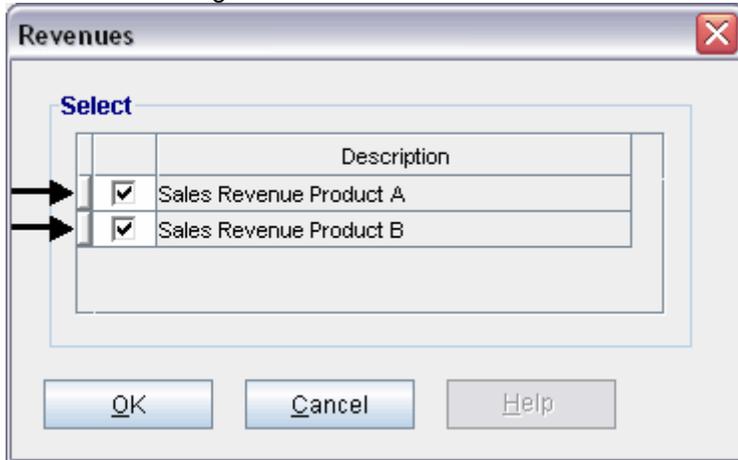
Open the Expenses Folder

1. Select the row with the Description 'Materials' and click the '% of Revenues' button ( lower left corner).

Make the following selections



2. Select the row with the Description 'Sales Commissions' and hit the '% of Revenues' button. Make the following selections



### **Financing Folder**

The organization's bank approved the following loan to fund the expansion.

Start Date: March 2010

Type: Standard Mortgage

Amount: \$3,000,000

Time Period: 7 years

Amortization Period: 7 years

Interest Rate: 7.00% per year

Payments: Monthly

1. Click on the Add Mortgage button and enter the following into the Mortgage window

**Mortgage**

**Mortgage Details**  
 Analysis Period: 2010 Mar to 2020 Feb  
 Commencing: 2010 Month: March  
 Type: Standard Mortgage  
 Amount: \$ 3,000,000 Interest Rate: Fixed  
 Description: Financing

**Mortgage Settings**  
 Payment Frequency: Monthly  
 Additional Payments/Borrowing:   
 Payment Rounded: Up to Nearest Cent  
 Compounding Frequency: Monthly

**Terms and Amortization Details**  
 No of (Balloon) Terms: 1

Term No	Time Period		Amortization		Nominal Interest Rate
	Years	Months	Years	Months	
1	7	0	7	0	7.000%

OK Compute Fill Down Cancel Help Comments

**Salvage Value Folder**

Salvage Value: \$300,000

Disposition Costs: 10.00% of Salvage Value

1. Enter the following into the Salvage Value folder

Working Capital Expenses Revenue Financing **Salvage Value**

**Disposition Costs**

Description	Entry Choice	Expense
Selling Expenses	% of Salvage Value	10.00%

Add Insert Delete Move

**Salvage Value**

Description	Capital Investment	Salvage Value
Plant Expansion	\$ 11,000,000	\$ 300,000

**Save This Project**

## INSTRUCTIONS FOR ENTERING OPTION B: \$15,000,000 EXPANSION

### Getting started

The first step is to create a duplicate of Project A.

1. Open Project A within Investit Decisions.
2. Go to the File menu and select Save As.
3. Change the name to Project B and Save

### Project Info Folder

Project Name: Change to "Hamilton \$15M Expansion"

Project Description: Change to "Production for Product's A, B & Z"

Make the following changes to the Project Info folder;

Project Info.	Investor	Investment	Working Capital	Expenses
<b>Report Headers</b>				
Project Name	Hamilton \$15M Expansion ←			
Project Description	Production of Product's A, B & Z ←			
<b>Analysis Time Period</b>				
10	Years	Change Analysis Time Period		
<b>Entry Information</b>				
Enter Revenue and Expenses	Monthly	Change Entry Information		
Starting Date	March 2010			

### Investor Folder

The Investor folder is unchanged.

### Investment Folder

Plant Expansion: Change to \$15,000,000

Project Info.	Investor	Investment	Working Capital	Expenses	Revenue		
CCA Claim Option: Full CCA Claim							
<b>Investments</b>							
Inflate			CCA Claim Setting				
Description	Amount	Year	Month	CCA Class	CCA Rate	First Year	Claim CCA in Last Year
Plant Expansion →	\$ 15,000,000	2010	Mar	Equipment/Machinery	30.00%	50.00%	<input checked="" type="checkbox"/>

**Working Capital Folder**

**Working Capital:** Change to \$260,000

Project Info.	Investor	Investment	Working Capital	Expenses	Revenue
<b>Working Capital</b>					
Description	Entry Choice			2010 Mar...	2010 Apr...
Working Capital	Add or Subtract (-) Working Capital			\$ 260,000	\$ 0

**Revenue Folder**

**Important Note:**

Make the changes to the Revenue Folder before making the changes to the Expenses folder

Why? Because the “Materials” and “Sales Commission” expenses are a “% of the Revenue(s) for Products A, B & Z

The new facilities produce three product versions. Projected pricing and sales are:

**Product A**

No change

**Product B**

No change

**Product Z**

Add the information for the product Z

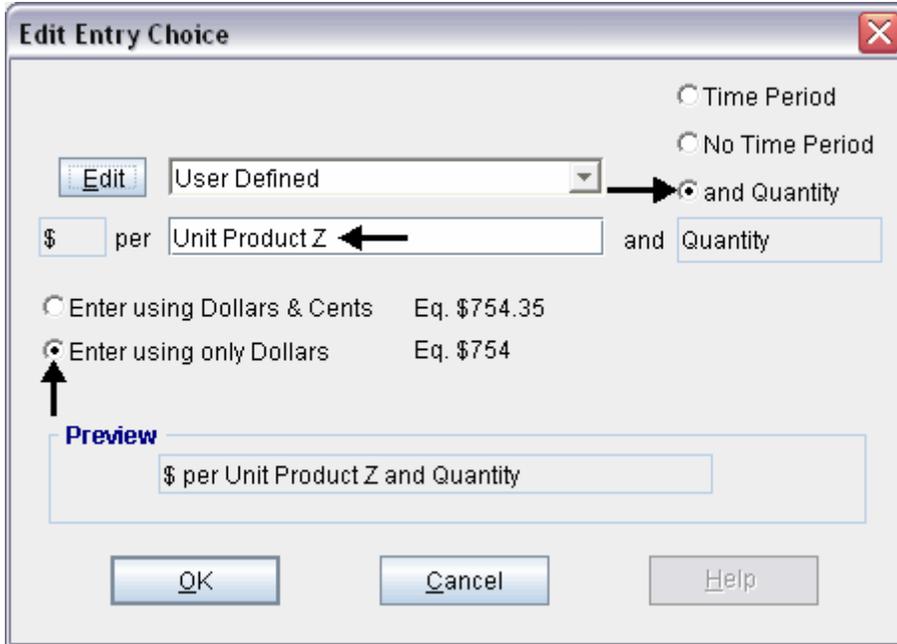
**Price:** Year 2010: \$2,100 per Unit for the first 12 months increasing at 4.00% per year compounding

**Quantity (Sales per Month):**

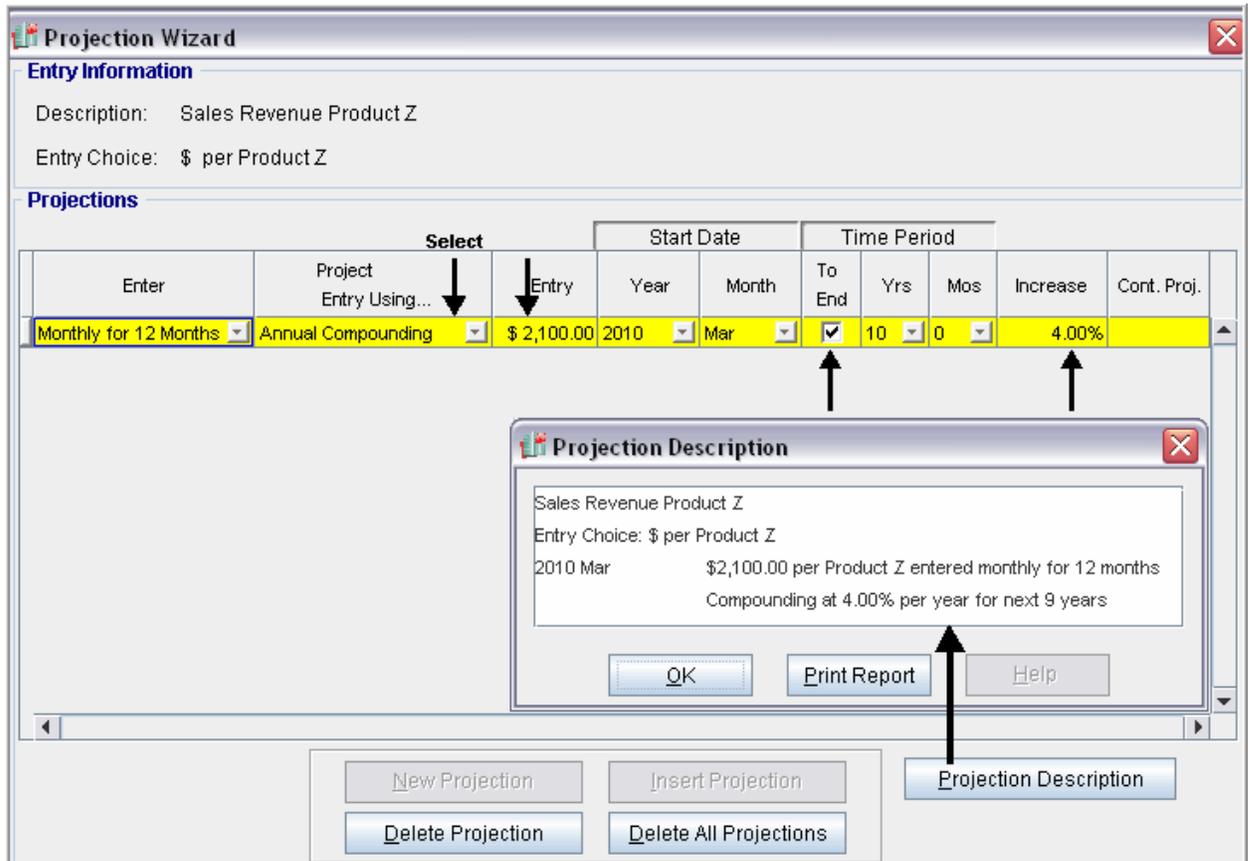
Year 2010: 35 per month then increasing at 7.00% per year compounding

Steps for setting up the Revenue folder

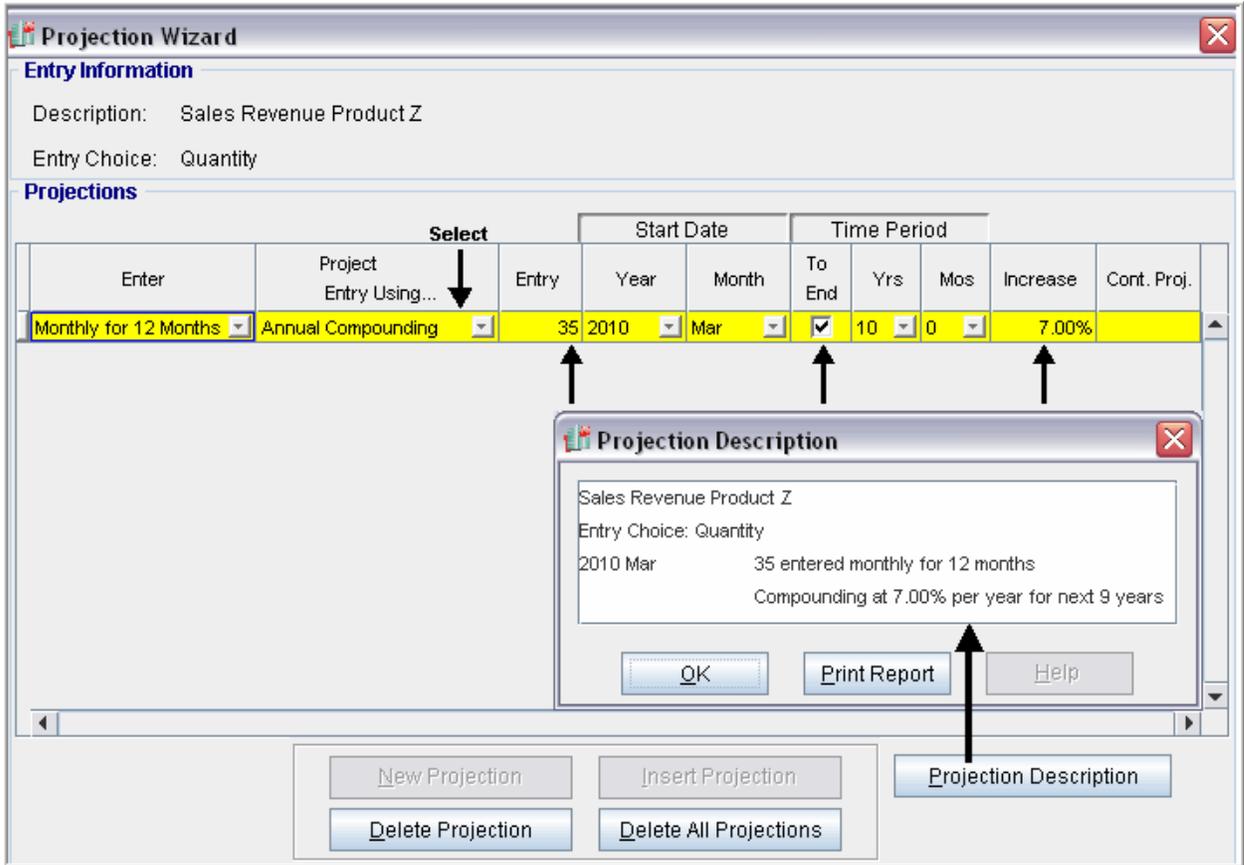
1. Press the “ADD” button to create Product Z.
2. Enter the Description ‘Sales Revenue Product Z’
3. Create the following entry choice (see procedure on pages 18-19)



4. Click on the Project Wizard button.
5. Enter the following into the Projection Wizard



6. Select the Quantity row for Product Z and click on the Projection Wizard button
7. Enter the following into the Projection Wizard



**Expenses Folder**

**Labor:** Change from \$60,000 to \$80,000 per Month for 12 months then increasing at 2.00% per year compounding for 2 years then 3.00% compounding per year

**Materials:**

Change from 40.00% to 37.00% of Revenues

Change the “% of Revenue(s)” from 40.00% of the revenue for Product A & B to 37.00% of Products A, B and Z

**Notes:**

Material costs have been reduced from 40.00% to 37.00% of sales because of economies of scale

**Repairs & Maintenance:** Change from \$20,000 per month to \$25,000 per Month for 12 months then increasing at 3.00% compounding per year

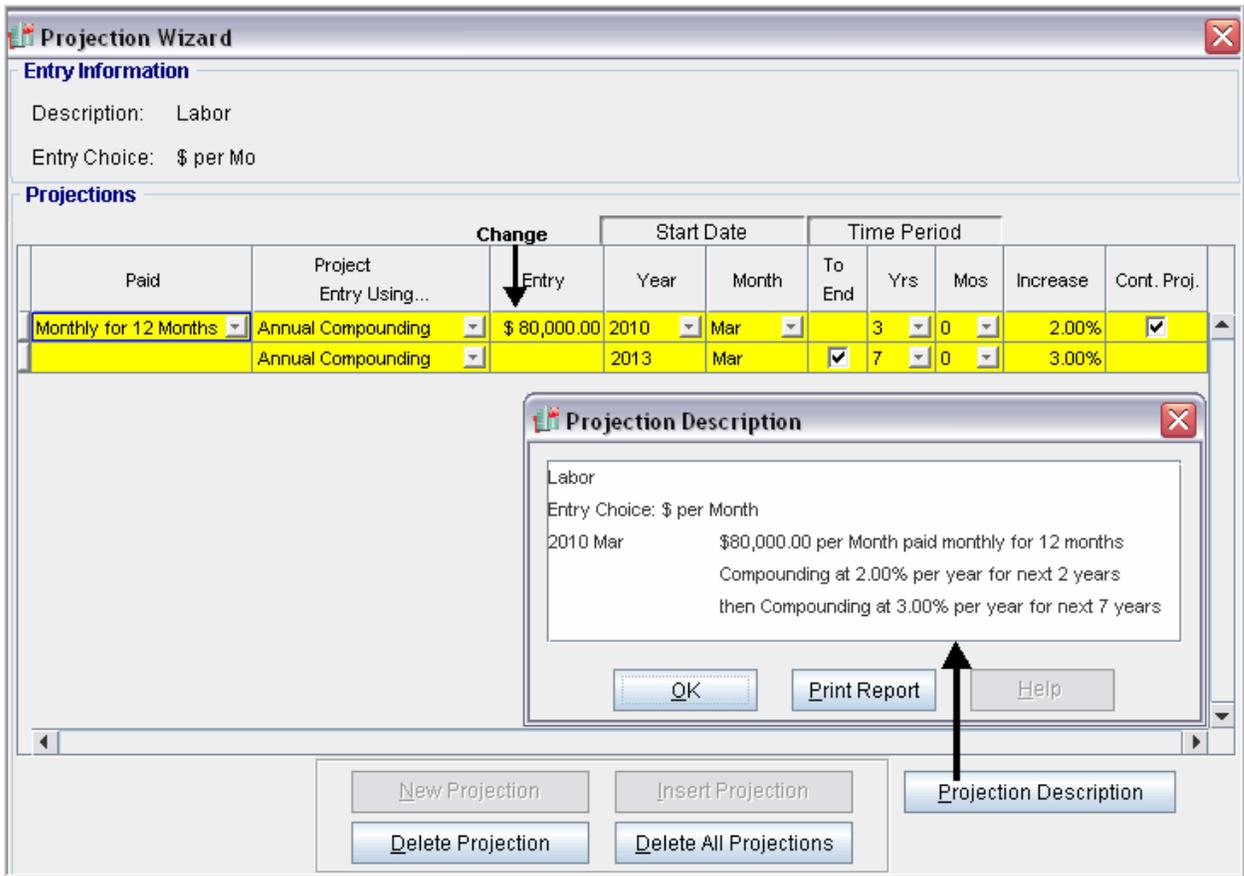
**Utilities:** Change to \$3,700 per month for 12 months then increasing at 4.00% compounding per year

**Marketing and Sales Fixed Cost:** Change from \$60,000 to \$70,000 per Month for 12 months then increasing at 4.00% per year compounding

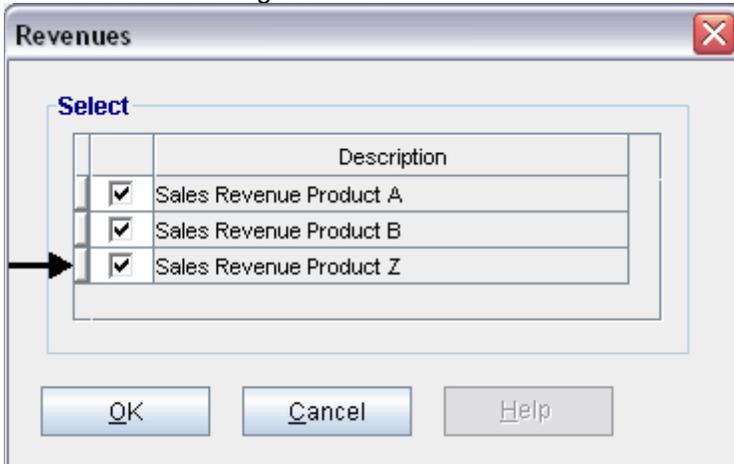
**Sales commission:**

20.00% of revenue. No change. Change the “% of Revenue(s)” from 20.00% of the revenue for Product A & B to 20.00% of Products A, B and Z

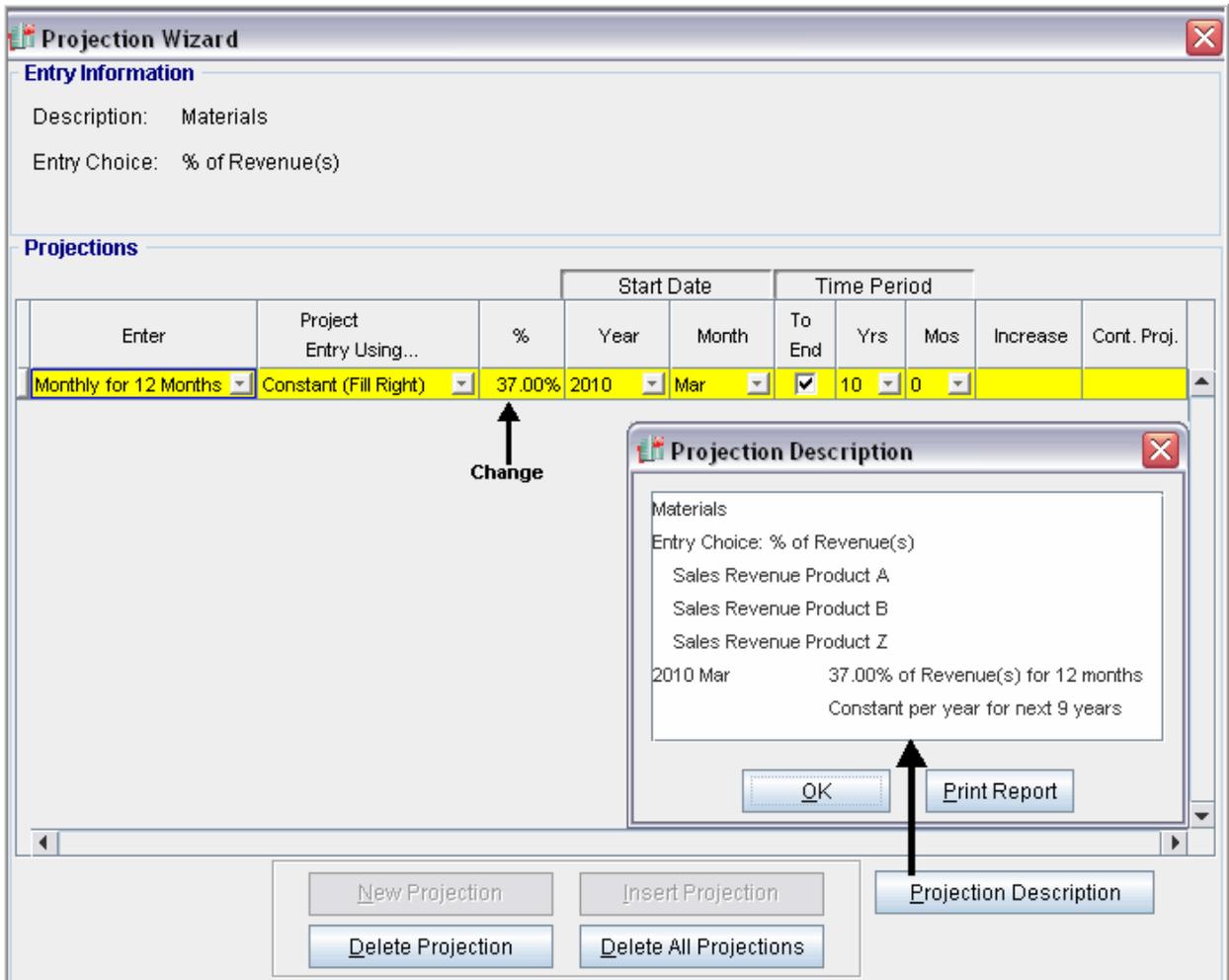
1. Select the row with the description 'Labor' and click on the Projection Wizard button
2. Enter the following into the Projection Wizard



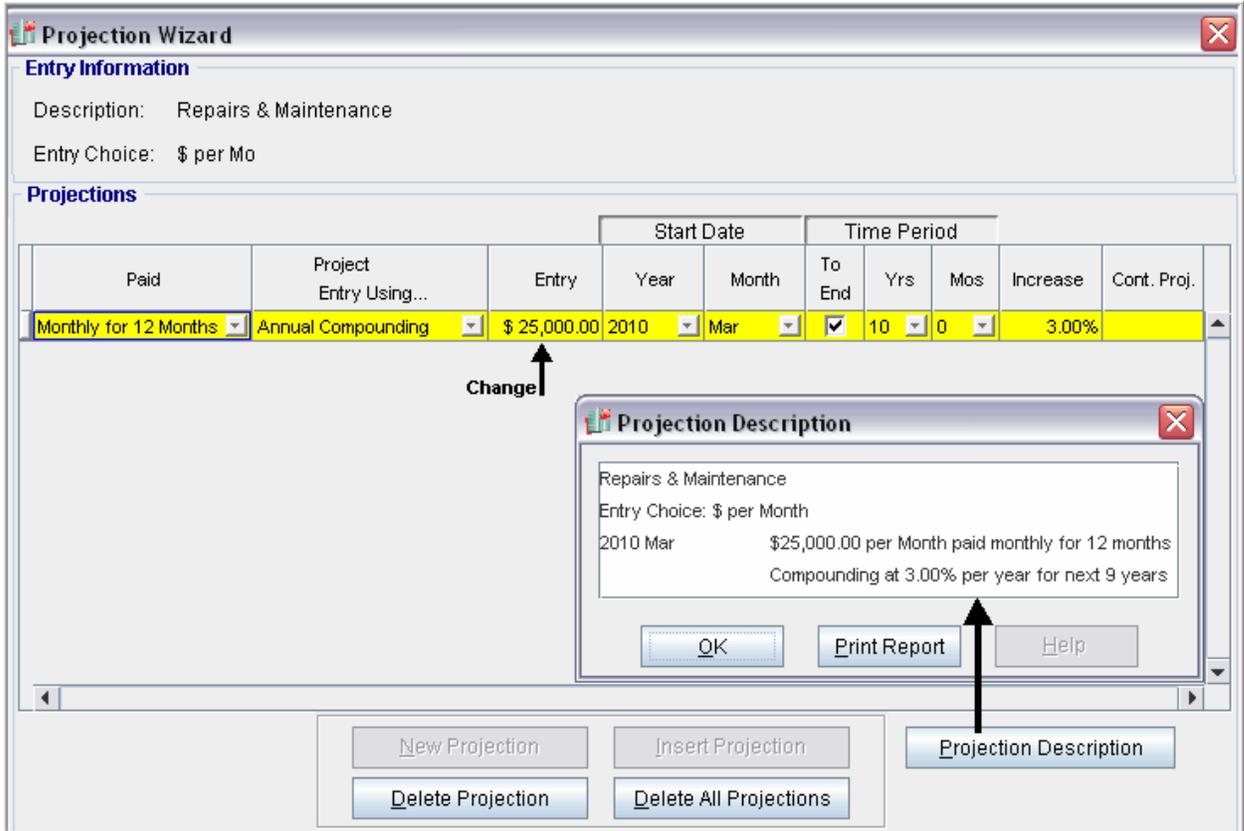
1. Select the row with the description 'Materials' and click on the '% of Revenues' button
2. Make the following selections



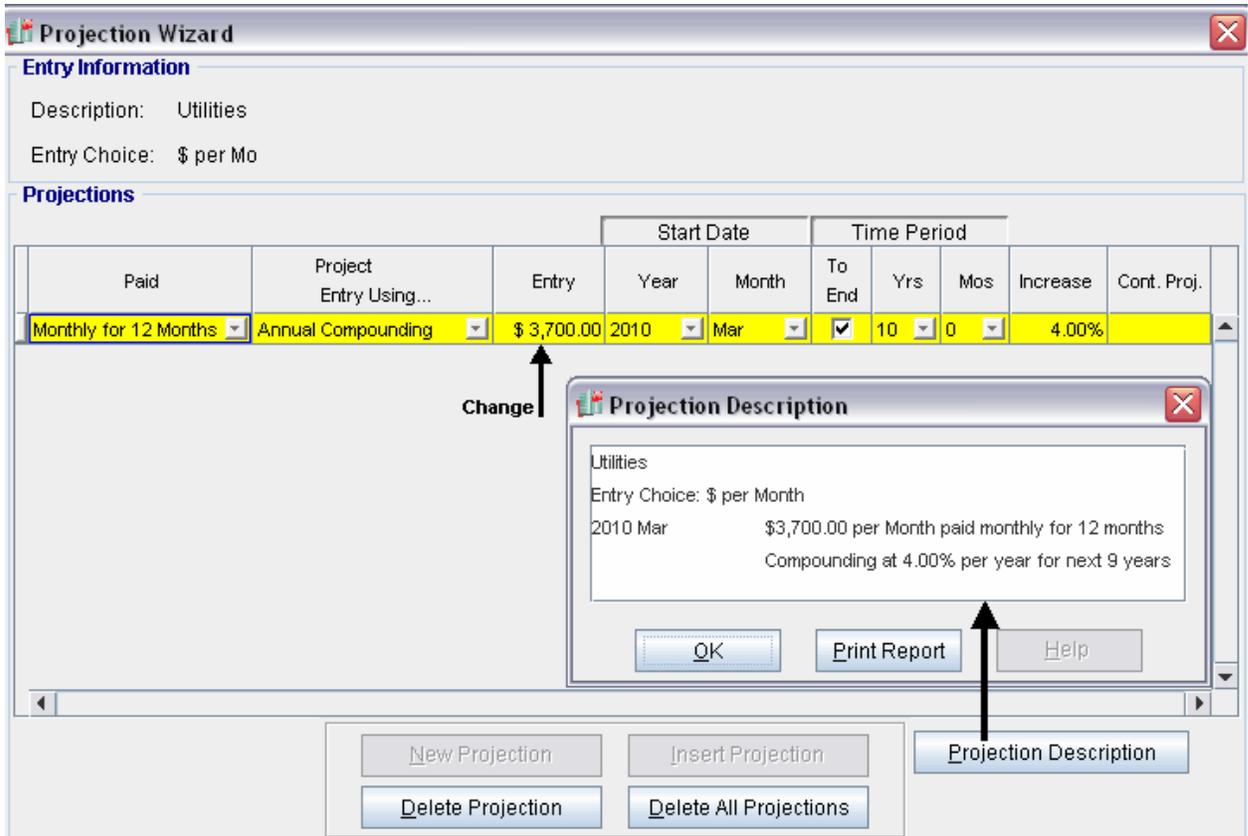
- Click on the Projection Wizard button and enter the following



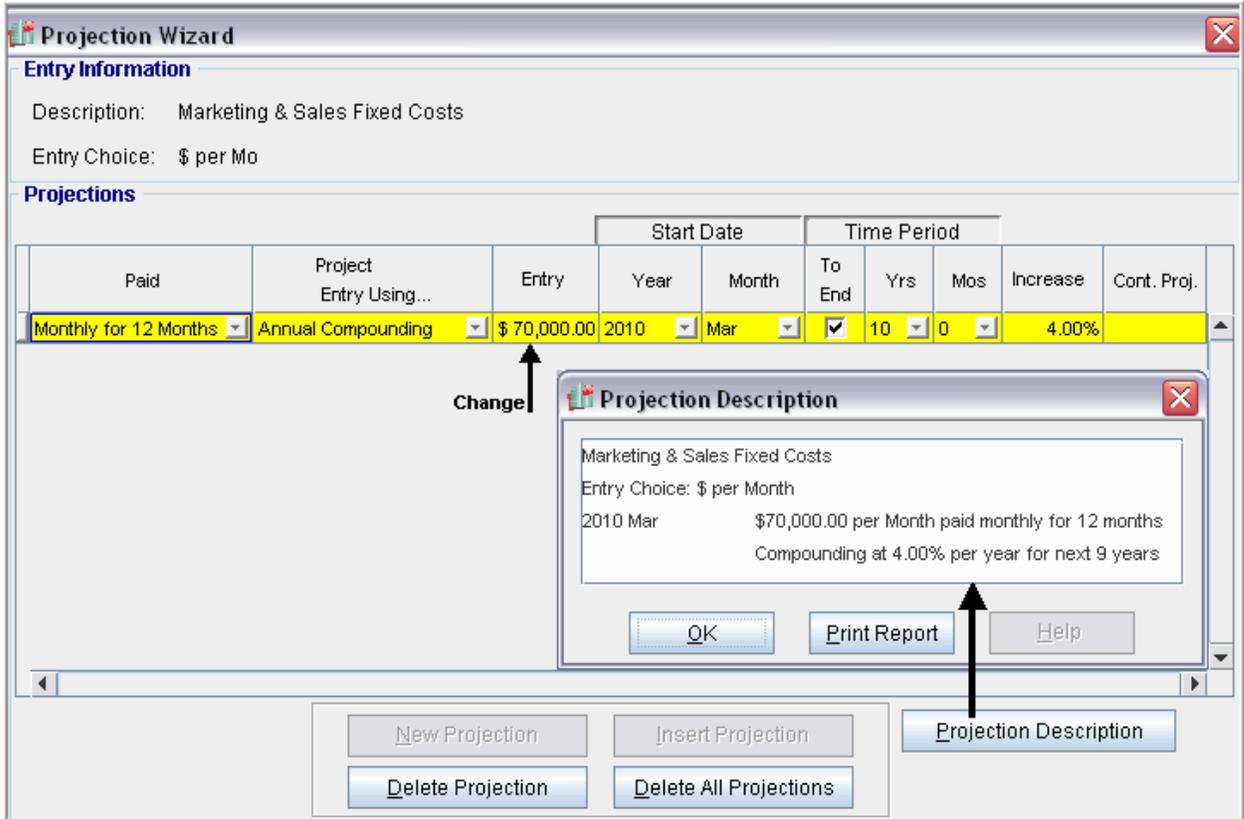
- Select the row with the description 'Repairs & Maintenance' and click on the Projection Wizard button
- Enter the following into the Projection Wizard



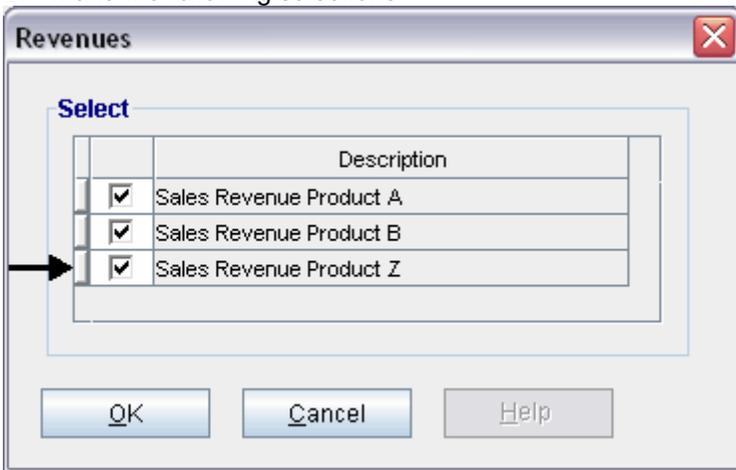
1. Select the row with the description 'Utilities' and click on the Projection Wizard button
2. Enter the following into the Projection Wizard



1. Select the row with the description 'Marketing & Sales Fixed Costs' and click on the Projection Wizard button
2. Enter the following into the Projection Wizard



1. Select the row with the description 'Sales Commissions' and click on the '% of Revenues' button
2. Make the following selections



3. The entries in the Projection Wizard remain unchanged

### Financing Folder

No change

### Salvage Value Folder

Salvage Value: Change to \$400,000

Working Capital	Expenses	Revenue	Financing	Salvage Value
<b>Disposition Costs</b>				
Description			Entry Choice	Expense
Selling Expenses			% of Salvage Value	10.00%
Add    Insert    Delete    Move				
<b>Salvage Value</b>				
Description		Capital Investment	Salvage Value	
Plant Expansion		\$ 15,000,000	→ \$ 400,000	

**SAVE YOUR PROJECT**

## DECIDING BETWEEN THE TWO OPTIONS A & B

To decide between the two options use the;

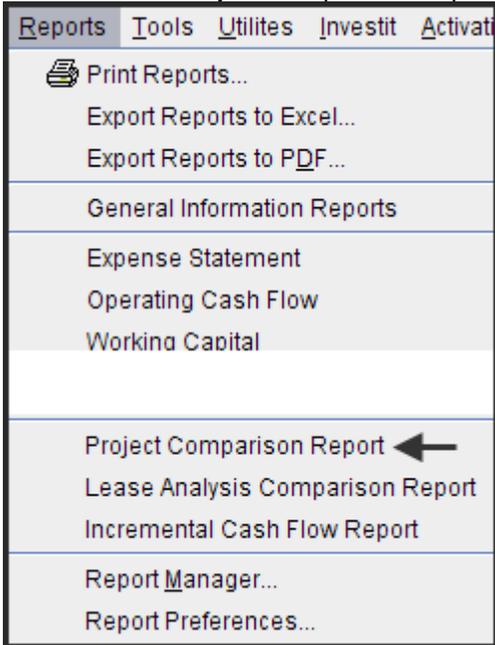
- a. The Project Comparison Report and
- b. The Incremental Cash Flow Report

### Project Comparison Report

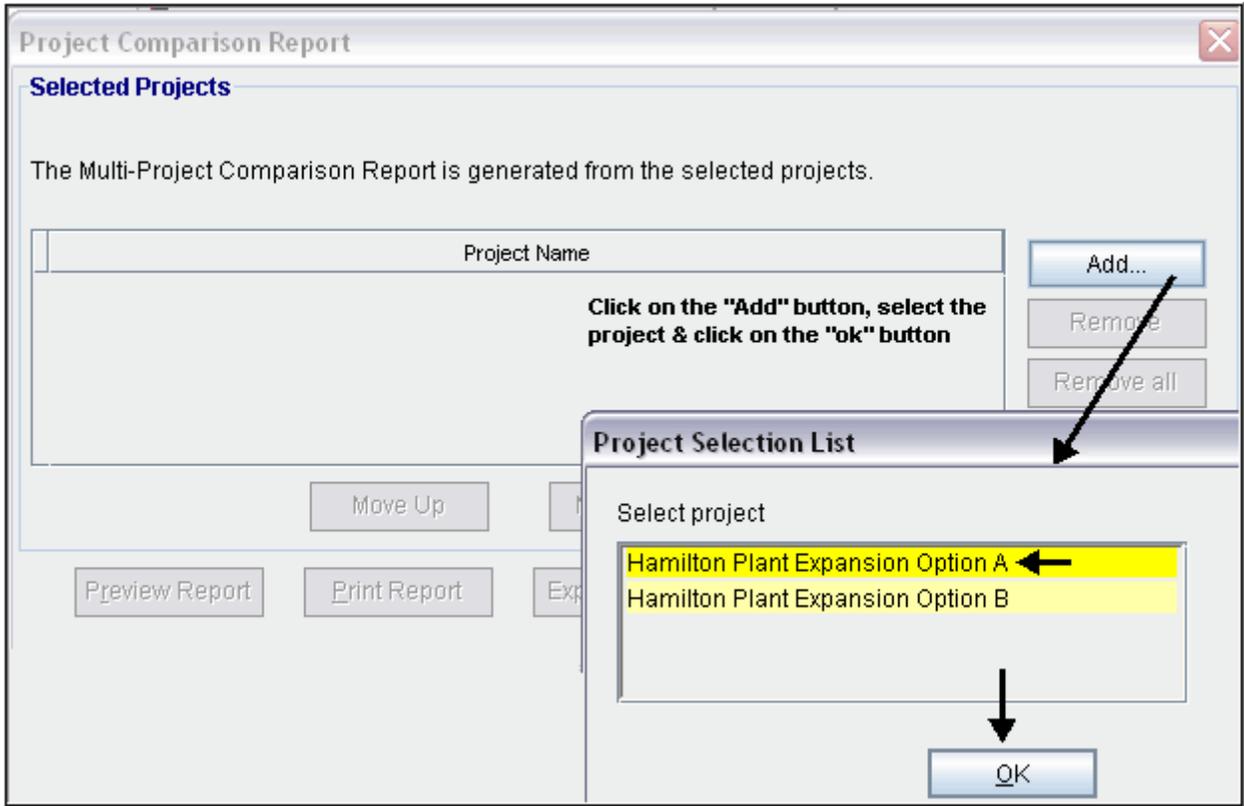
Up to four projects can be compared side by side.

Step involved in selecting the projects for the Project Comparison Report.

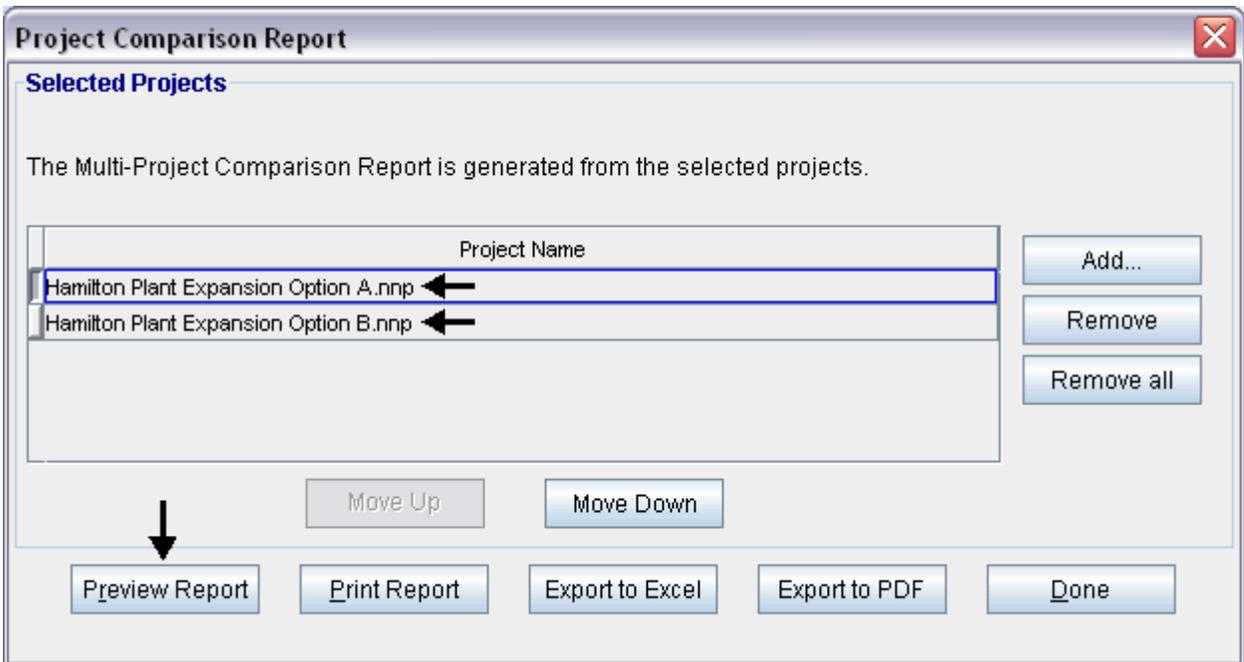
1. Select the Project Comparison Report on the Reports menu



2. On the Project Comparison Report dialog click on the "Add" button to display the Report Selection List. Select the Project and click 'Ok". Repeat the process to add another project.



3. The diagram below shows selected projects to be displayed in the "Project Comparison Report"



Sample Project Comparison Report

<b>Project Comparison Report (Before Tax)</b>			
Net Cash Flow (Before Tax)			
		<u>Hamilton Plant Expansion Option A</u>	<u>Hamilton Plant Expansion Option E</u>
Year	0	(8,200,000)	(12,260,000)
	1	260,664	400,524
	2	1,081,752	1,313,054
	3	1,302,700	1,594,339
	4	1,592,230	1,950,658
	5	1,874,437	2,302,442
	6	2,198,421	2,702,670
	7	2,575,515	3,177,438
	8	3,547,184	4,241,409
	9	3,988,114	4,794,616
	10	4,955,488	6,034,120
	Total	15,176,505	16,251,268
Financial Return Before Tax			
Internal Rate of Return (IRR)		→ 17.14%	→ 13.42%
MIRR		11.85%	9.60%
Short term financing rate		7.000%	7.000%
Short term reinvestment rate		2.500%	2.500%
Net Present Value (NPV)		→ \$ 2,642,992 at 12.00%	→ \$ 1,016,747 at 12.00%
Annual Equivalency		\$ 467,768 at 12.00%	\$ 179,948 at 12.00%
Benefit to Cost Ratio		1.21 at 12.00%	1.05 at 12.00%
Payback Period (Years)		5.95	6.63
Discounted Pay Back Period (Years)		8.27 at 12.00%	9.48 at 12.00%

**Interpretation and Decision**

The organizations minimum acceptable return (IRR) is 12.00% before tax.

On initial inspection it appears that both options exceed the desired return (IRR) of 12.00% and they should proceed with Option B and invest \$12,260,000. This conclusion is incorrect.

They should choose the option that;

1. Provides the highest Net Present Value (NPV)
2. The highest Benefit to Cost Ratio

This is Option A, which has a Net Present Value (NPV) at 12.00% of \$2,642,992 compared to \$1,016,747 for Option B

This can be clearly seen using Incremental Cash Flow Report

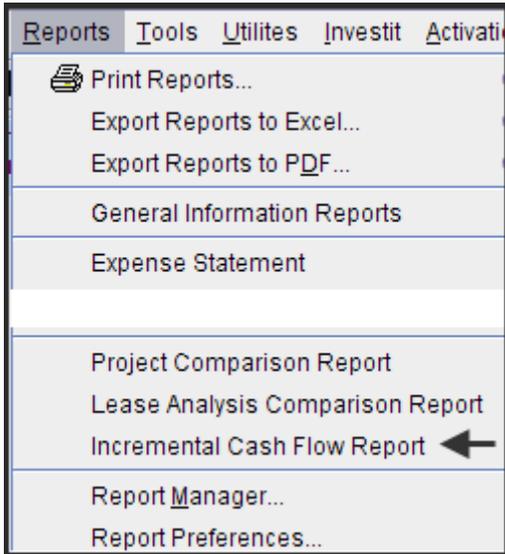
## Incremental Cash Flow Report

When carrying out “Incremental Cash Flow Analysis” the largest investment goes first for the Incremental Cash Flow Report.

In this example select Option B for \$12,260,000 first, and then subtract Option A the \$8,200,000 investment as follows...

### Steps

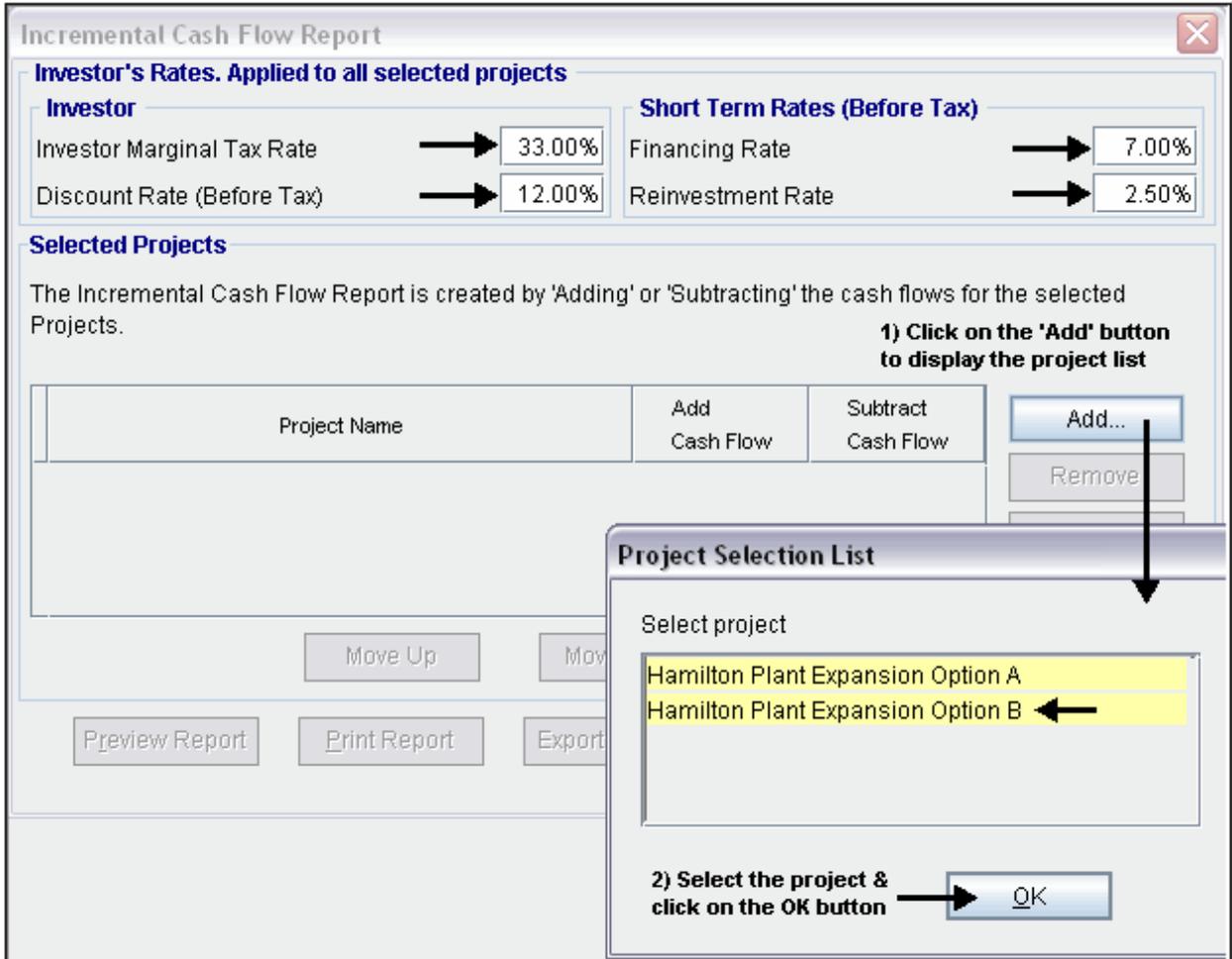
Select the Incremental Cash Flow on the Report menu



Enter;

Investor's Marginal Tax Rate  
Discount Rate  
Short Term Rates

On the "Incremental Cash Flow Report" dialog click on the "Add" button to display the Report Selection List. Select the Project and click 'Ok". Repeat the process to add another project. The Option B project was selected first because the investment of \$12,260,000 is larger than the \$8,200,000 investment for Option A.



The selected projects for the Incremental Cash Flow Report are:

**Investor's Rates. Applied to all selected projects**

<b>Investor</b>		<b>Short Term Rates (Before Tax)</b>	
Investor Marginal Tax Rate	33.00%	Financing Rate	7.00%
Discount Rate (Before Tax)	12.00%	Reinvestment Rate	2.50%

**Selected Projects**

The Incremental Cash Flow Report is created by 'Adding' or 'Subtracting' the cash flows for the selected Projects.

Project Name	Add Cash Flow	Subtract Cash Flow	
Hamilton Plant Expansion Option B.nnp ←	→ <input checked="" type="radio"/>	<input type="radio"/>	Add...
Hamilton Plant Expansion Option A.nnp ←	<input type="radio"/>	→ <input checked="" type="radio"/>	Remove

**The Net Cash Flow for Option A will be subtracted from the Net Cash Flow for Option B**

Move Up
Move Down

Preview Report
Print Report
Export to Excel
Export to PDF
Done

Click on the "Preview Report" button to display the "Incremental Cash Flow Report"

<b>Incremental Cash Flow Report (Before Tax)</b>			
<b>The Net Cash Flow from Option A is subtracted from the Net Cash Flow from Option B to give the 'Incremental Cash Flow'</b>			
Net Cash Flow( Before Tax)			
	Plus Hamilton Plant Expansion Option B	Minus Hamilton Plant Expansion Option A	Incremental Net Cash Flow (Before Tax)
Year			
0	(12,260,000)	(8,200,000)	(4,060,000)
1	400,524	260,664	139,860
2	1,313,054	1,081,752	231,303
3	1,594,339	1,302,700	291,639
4	1,950,658	1,592,230	358,427
5	2,302,442	1,874,437	428,006
6	2,702,670	2,198,421	504,248
7	3,177,436	2,575,515	601,921
8	4,241,409	3,547,184	694,225
9	4,794,616	3,988,114	806,502
10	6,034,120	4,955,488	1,078,632
Total	16,251,268	15,176,505	1,074,763
<b>Before Tax Financial Return</b>			
Internal Rate of Return (IRR)	➔ 13.42%	➔ 17.14%	➔ 3.48%
Net Present Value (NPV) at 12.00%	\$ 1,016,747	\$ 2,642,992	(\$ 1,626,244)
Modified Internal Rate of Return (MIRR)	9.60%	11.85%	3.16%
Short term financing rate	7.00%	7.00%	7.00%
Short term reinvestment rate	2.50%	2.50%	2.50%
Annual Equivalency at 12.00%	\$ 179,948	\$ 467,768	(\$ 287,820)
Benefit to Cost Ratio at 12.00%	1.05	1.21	N/A
Payback Period	6.63 years	5.95 years	9.00 years
Discounted Pay Back Period at 12.00%	9.48 years	8.27 years	N/A

### Interpretation and conclusion

If the organization's minimum acceptable rate of return (IRR) is 12.00%, both Option A and Option B seem to be acceptable because they both provide a return (IRR) higher than 12.00%.

However, the return (IRR) on the incremental investment of \$4,060,000 for Option B is 3.48%, which is far below the minimum acceptable value of 12.00%. In this case Option B should be rejected and Option A accepted.

The other approach is to select the project with the highest Net Present Value (NPV), which is Option A

Both the 'Incremental Cash Flow' approach or choosing the option with the highest Net Present Value (NPV) will result in the same choice when dealing with mutually exclusive investments.