

## **KEEP OR REPLACE ANALYSIS INCLUDING APPLICATION OF INCREMENTAL CASH FLOW ANALYSIS**

### **USA Example**

#### **INTRODUCTION**

This is a “Keep” or “Replace” analysis using the following templates;

1. Keep Revenue & Expenses Yearly Template
2. Replace Revenue & Expenses Yearly Template

This example is for manufacturing but the “Keep” or “Replace” analysis applies to profit and non profit organizations such as government, universities, hospitals and service industries.

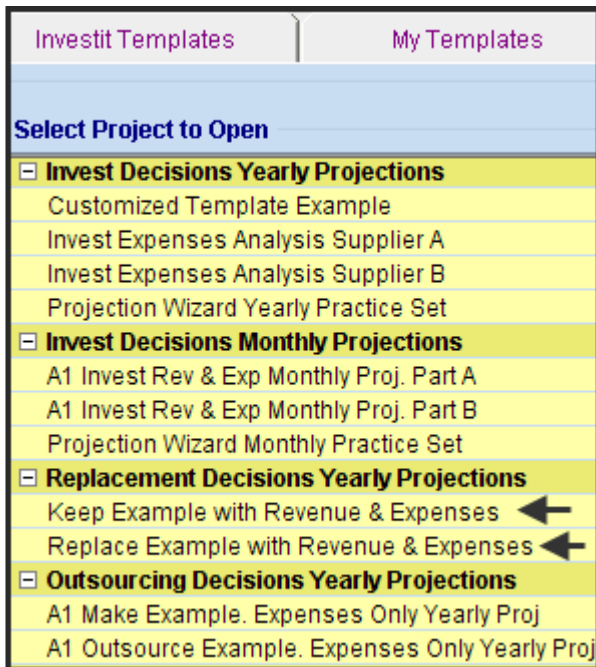
#### **Non profit examples of Keep or Replace decisions**

1. A hospital is considering whether to replace and aging x-ray machine or not
2. A city is considering whether to replace the traditional parking meters with parking meter stations which requires a substantial investment, but will generate additional revenue and reduce labor costs

#### **VERIFYING YOUR ANALYSIS**

You can compare your analysis against the two Investit Decisions Examples;

1. Keep Example with Revenue & Expenses
2. Replace Example with Revenue & Expenses



**KEEP or REPLACE CASE STUDY**

A manufacturing organization is considering replacing aging production equipment used to produce plastic bottles with a more technologically advanced model, which will offer the following benefits:

1. Less rejected products resulting in lower manufacturing costs per unit
2. The new computerized system allows faster set up and less down time
3. Increase in sales because of increased production capacity
4. Lower labor costs

The equipment was bought 5 years ago for \$9,000,000 and the depreciation claimed is based on Personal Prop. St Line with a 7 years recovery period. If retained, a major overhaul costing \$2,500,000 will be required in year 4. The salvage value at the end of the Analysis Period is \$75,000

If the "Existing Equipment" is sold now, the current salvage value is \$800,000 before tax and \$740,000 after tax

The equipment was financed with a loan of \$4,000,000, 8.00% interest repayable over 7 years with uniform blended payments of principle & interest. If the equipment is sold the loan will have to be paid off. The current outstanding loan balance is \$1,378,479

The new equipment will cost \$11,000,000 installed and will be depreciated using Personal Prop. St Line with a 7-year recovery period. The equipment will be finance with \$6,000,000 loan interest repayable over 7 years with uniform blended payments of principle & interest.

**Summary**

	<b>Existing Equipment</b>	<b>New Equipment</b>
Investment	\$9,000,000 5 years ago Major overhaul Year 4 Jan \$2,500,000	\$11,000,000
Depreciation Method	Personal Prop. St Line 7 year recovery period	Personal Prop. St Line 7 year recovery period
Working Capital Addition		\$90,000
Salvage Value	Existing Equipment \$800,000 before tax. Today \$740,000 after tax. Today \$75,000 in 9 years  Major Overhaul \$0	\$1,000,000 in 9 years
Sales	\$3,500,000 per Yr increasing at 5.00% compounding per year	\$5,500,000 per Yr increasing at 5.00% compounding per year
Labor	30.00% of Sales	20.00% of Sales
Materials	25.00% of Sales	20.00% of Sales
Repairs & Maintenance	\$324,000 per year increasing at 8.00%	\$536,000 increasing at 5.00% per Yr
Utilities	\$190,000 per year increasing at 6.00% per year	\$335,000 increasing at 5.00% per year
Insurance	\$35,000 per year increasing at 6% per year	\$65,000 increasing at 6.00% per year
Selling expenses	10.00% of sales	10.00% of Sales
Financing		
Loan Amount	\$4,000,000	\$6,000,000
Current Outstanding Balance	\$1,378,479	--
Amortization Period	7 years	7 years
Remaining Amortization	2 years	--
Interest Rate	7.00%	9.00%

## KEEP ANALYSIS

### PROJECT INFO Folder

Project Name: Plastic Bottle Manufacturing Division  
Project Description: Keep Equipment Analysis  
Analysis Period: 9 Years  
Analysis Start Date: Year 1 Jan

### INVESTOR Folder

Marginal Tax Rate (Including State Taxes): 35.00%  
Capital Gain Rate: 35.00%  
Recaptured Deprec. Rate: 35.00%  
Desired Return or Discount Rate (Before Tax): 13.00%  
Short Term Rates  
    Financing Rate: 8.00%  
    Reinvestment Rate: 2.50%

### INVESTMENT Folder

- Existing Equipment: \$9,000,000  
    Depreciation: Personal Prop. St Line 200%  
    Original Recovery Period: 7 years  
    Value of Asset when Acquired: \$9,000,000  
    How Long Ago: 5 years
- Major overhaul: Year 4 January \$2,500,000  
    Depreciation: Personal Prop. St Line 200%  
    Original Recovery Period: 7 years

### WORKING CAPITAL Folder

Working Capital: \$0

### EXPENSES Folder

**Labor:** 30.00% of Revenue

**Materials:** 25.00% of Revenue

**Repairs & Maintenance:**

\$324,000 per year for the first year then increasing at 8.00% compounding per year

**Utilities:**

\$190,000 per year for the first year then increasing at 6.00% compounding per year

**Insurance:**

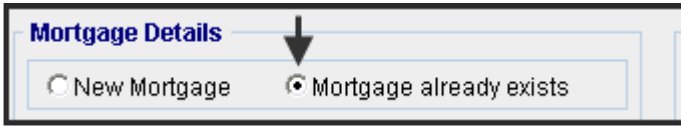
\$35,000 per year for the first year then increasing at 6.00% compounding per year

**Selling Expenses:** 10.00% of Revenue

### REVENUE Folder

**Sales:** \$3,500,000 per year for the first year then increasing at 5.00% compounding per year

**FINANCING Folder**



The screenshot shows a dialog box titled "Mortgage Details". Inside the dialog, there are two radio button options: "New Mortgage" and "Mortgage already exists". The "Mortgage already exists" option is selected, and a black arrow points to it from above.

“Mortgage already exists” means that the mortgage or loan was taken out to fund the purchase of the equipment five year ago. We need to enter the “Outstanding Balance” at the start of the Analysis Period and the remaining amortization period.

The principle and interest payments for the remaining two years will be included in the cash flow. The “Outstanding Balance” is used to generate the principle & interest payments for the remaining two year, but is not included in the cash flow

Description: Loan. Outstanding Balance

Type: Standard Mortgage

Amount: \$1,378,479 (The Outstanding Balance on the Analysis Start Date)

Time Period: 2 years

Amortization Period: 2 years (The remaining Amortization Period)

Interest Rate: 7.00% per year

Payments: Monthly

**SALVAGE VALUE Folder**

Existing Equipment: \$75,000

## REPLACE ANALYSIS

### PROJECT INFO Folder

Project Name: Plastic Bottle Manufacturing Division  
Project Description: Replace Equipment Analysis  
Analysis Period: 9 Years  
Analysis Start Date: Year 1 Jan

### INVESTOR Folder

Marginal Tax Rate (Including State Taxes): 35.00%  
Capital Gain Rate: 35.00%  
Recaptured Deprec. Rate: 35.00%  
Desired Return or Discount Rate (Before Tax): 13.00%  
Short Term Rates  
    Financing Rate: 8.00%  
    Reinvestment Rate: 2.50%

### INVESTMENT Folder

New Equipment: \$11,000,000 Year 1 Jan  
Depreciation: Personal Prop. St Line 200%

Salvage Value of Equipment being replaced

    Before Tax: \$800,000

    After Tax: \$740,000

    Financing Repaid: \$1,378,479 (Repayment of outstanding balance for the bank loan for the preexisting equipment purchased 5 years ago)

### WORKING CAPITAL Folder

Working Capital: \$90,000 Year 1 Jan

### EXPENSES Folder

**Labor:** 20.00% of Revenue

**Materials:** 20.00% of Revenue

**Repairs & Maintenance:**

    \$536,000 per year for the first year then increasing at 5.00% compounding per year

**Utilities:**

    \$335,000 per year for the first year then increasing at 5.00% compounding per year

**Insurance:**

    \$65,000 per year for the first year then increasing at 6.00% compounding per year

**Selling Expenses:** 10.00% of Revenue

### REVENUE Folder

**Sales:** \$5,500,000 per year for the first year then increasing at 5.00% compounding per year

**FINANCING Folder**

Description: Equipment Loan  
Start Date: Year 1 January  
Type: Standard Mortgage  
Amount: \$6,000,000  
Time Period: 7 years  
Interest Rate: 9.00% per year  
Payments: Monthly  
Compounding Period: Monthly

**SALVAGE VALUE Folder**

New Equipment: \$1,000,000

**Template selection**

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

1. The analysis involves revenue & expenses
2. Projections are Yearly

Template: Keep Revenue & Expenses Yearly

**STEPS**

Using the Keep and Replace Revenue & Expenses Yearly projections templates;

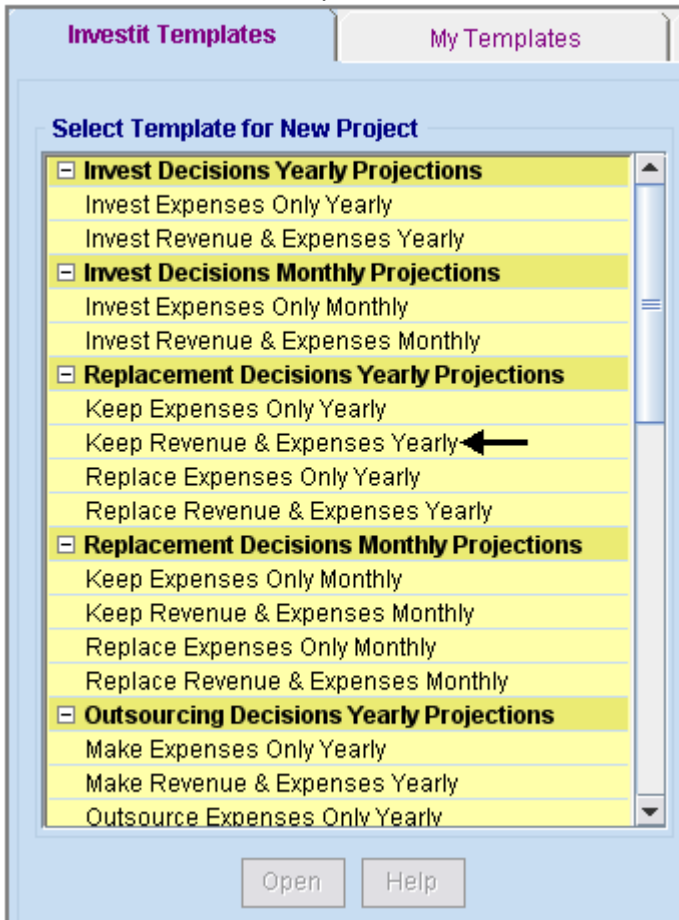
1. Enter the analysis for keeping the equipment
2. Enter the analysis for replacing the equipment
3. Use the "Project Comparison Report" or the "Incremental Cash Flow Report" to compare the two options

## INSTRUCTIONS FOR ENTERING THE “KEEP” ANALYSIS

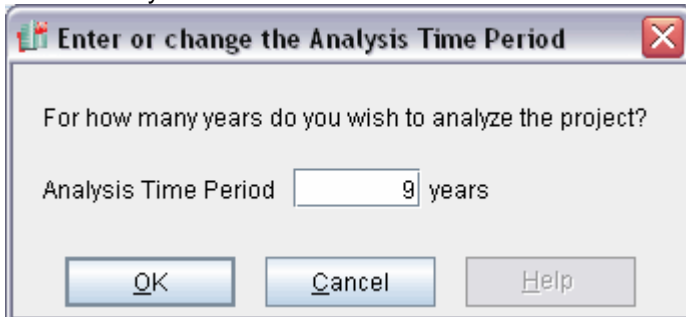
### Getting started

The first step is to open the Investit Decisions Template “Keep Revenue & Expenses Yearly” as follows:

1. Open Investit Decisions.
2. Select the Investit Templates folder



3. Select and open the Investit template “Keep Revenue & Expenses Yearly”. The analysis period dialog will open at this point.
4. Enter 9 years and click OK



**Entering the project data and information**

**Project Info Folder**

Project Name: Plastic Bottle Manufacturing Division  
 Project Description: Keep Equipment Analysis  
 Analysis Period: 9 years

Project Info.	Investor	Investment	Working Capital	Expenses
<b>Report Headers</b>				
Project Name	Plastic Bottle Manufacturing Division ←			
Project Description	Keep Equipment Analysis ←			
<b>Analysis Time Period</b>				
	9	Years	Change Analysis Time Period	
<b>Entry Information</b>				
Enter Revenue and Expenses	Yearly		Change Entry Information	
Starting Date	January Year 1			

**INVESTOR Folder**

Marginal Tax Rate (Including State Taxes): 35.00%  
 Capital Gain Rate: 35.00%  
 Recaptured Deprec. Rate: 35.00%  
 Desired Return or Discount Rate (Before Tax): 13.00%  
 Short Term Rates  
 Financing Rate: 8.00%  
 Reinvestment Rate: 2.50%

Project Info.	Investor	Investment	Working Capital	Expenses	Revenue
<input type="checkbox"/> Turn off Tax Calculations					
<b>Tax Rate</b>					
Investor's Marginal Tax Rate	35.00%				
Capital Gain Tax Rate	35.00%				
Recaptured Depreciation Tax Rate	35.00%				
<b>Discount Rate or Desired Return on Investment</b>					
Before Tax	→ 13.00%				
After Tax	→ 8.45%				
<b>Short Term Rates</b>					
<b>Before Tax</b>					
Financing Rate	→ 8.000%				
Reinvestment Rate	→ 2.500%				
<b>After Tax</b>					
Financing Rate	5.200%				
Reinvestment Rate	1.625%				



**INVESTMENT Folder**

- Existing Equipment: \$9,000,000  
 Depreciation: Personal Prop. St Line 200%  
 Original Recovery Period: 7 years  
 Value of Asset when Acquired: \$9,000,000  
 How Long Ago: 5 years
- Major overhaul: Year 4 January \$2,500,000  
 Depreciation: Personal Prop. St Line 200%  
 Original Recovery Period: 7 years

Instructions for setting up the Investment folder

- Select Row 1 'Existing Equipment' and click on the 'Edit Existing Depreciation' button
- Make the following entries

**Preexisting Investment**

Description: Existing Equipment

Depreciation Method: Personal Prop. 200% DB

Value of the Asset when Acquired: \$ 9,000,000

Original Recovery Period: 7.0

How Long Ago? Year: 5 Month: 0

Applied the Half-Year rule

Undepreciated Balance (Book Value): \$ 2,008,092

Remaining Recovery Period: 2.00

**Make the above entries and then click 'Compute'**

Buttons: OK, Compute, Cancel, Help

- Select row 2 'New Equipment' and make the following changes

Project Info.		Investor		Investment		Working Capital		Expenses		Revenue	
<b>Investments</b>											
Inflate											
Description	Amount	Year	Month	Depreciation Method	Recovery Period [yrs]	Investment		New		Exists	
Existing Equipment	\$ 2,008,092	Year 1	Jan	Personal Prop. 200% DB	2.00	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Major overhaul	\$ 2,500,000	Year 4	Jan	Personal Prop. 200% DB	7.0	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Working Capital Folder**

No Working Capital.

**Expenses Folder**

**Labor:** 30.00% of Revenue

**Materials:** 25.00% of Revenue

**Repairs & Maintenance:**

\$324,000 per year for the first year then increasing at 8.00% compounding per year

**Utilities:**

\$190,000 per year for the first year then increasing at 6.00% compounding per year

**Insurance:**

\$35,000 per year for the first year then increasing at 8.00% compounding per year

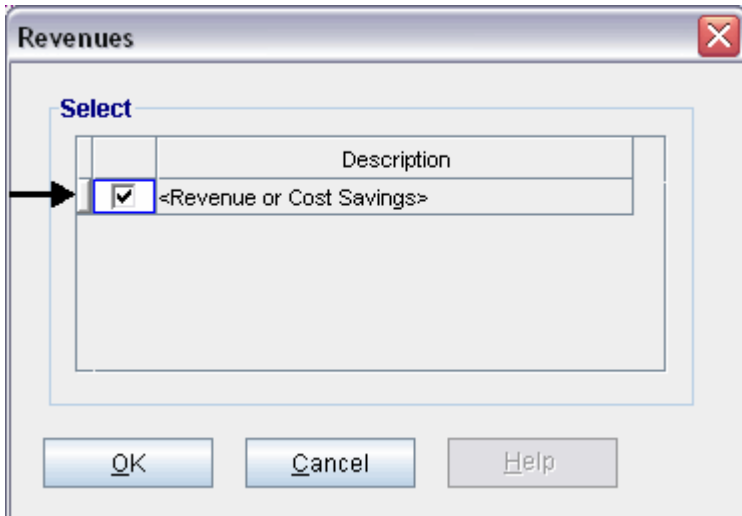
**Selling Expenses:** 10.00% of Revenue

Setting up the Expenses folder

1. Select row 7 'Rent' and click on the Delete button
2. Make the following changes to the Expenses folder

Project Info.	Investor	Investment	Working Capital	Expenses	
<b>Expenses</b>					
Description	Entry Choice	Qty	Category	Year 1 Jan...	
Labor	% of Revenue(s) ←	—	Common	0.00%	
Materials	% of Revenue(s) ←	—	Common	0.00%	
Repairs & Maintenance	\$ per Yr ←	—	Common	\$ 0	
Utilities	\$ per Yr ←	—	Common	\$ 0	
Insurance	\$ per Yr ←	—	Common	\$ 0	
Selling Expenses ←	% of Revenue(s) ←	—	Common	0.00%	

Fill out the % of Revenues windows as follows



Setting up Labor

1. Select row 1 'Labor'
2. Click on the Projection Wizard button and enter the following entries

**Projection Wizard**

**Entry Information**

Description: Labor

Entry Choice: % of Revenue(s)

**Projection**

%	Project Entry Using...	Increase	Starting Year	Time Period		Cont. Proj.
				To End	Yrs	
→ 30.00%	Constant (Fill Right)		Year 1	<input checked="" type="checkbox"/>	9	

**Projection Description**

Labor

Entry Choice: % of Revenue(s)

Sales

Year 1      30.00% of Revenue(s)

                 Constant per year for next 8 years

OK      Print Report

New Projection    Insert Projection    Delete Projection

Delete All Projections      Projection Description

Setting up Materials

1. Select row 2 'Materials'
2. Click on the Projection Wizard button and enter the following entries

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

**Entry Information:**  
 Description: Materials  
 Entry Choice: % of Revenue(s)

**Projection:**  
 A table with columns: %, Project Entry Using..., Increase, Starting Year, Time Period (To End, Yrs), and Cont. Proj. The first row is highlighted in yellow and contains the following data: 25.00%, Constant (Fill Right), [dropdown], Year 1, [checked checkbox], 9, [dropdown].

Below the table is a 'Projection Description' dialog box with the following text:  
 Materials  
 Entry Choice: % of Revenue(s)  
 Sales  
 Year 1            25.00% of Revenue(s)  
                          Constant per year for next 8 years

Buttons in the dialog box include 'OK', 'Print Report', and 'Help'. At the bottom of the main window, there are buttons for 'New Projection', 'Insert Projection', 'Delete Projection', 'Delete All Projections', and 'Projection Description'. Arrows indicate that the 'Projection Description' button is used to open the dialog box, and the 'To End' checkbox in the table is checked.

Setting up Repairs & Maintenance

1. Select row 3 'Repairs & Maintenance'
2. Click on the Projection Wizard button and enter the following entries

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

**Entry Information:**

- Description: Repairs & Maintenance
- Entry Choice: \$ per Yr

**Projection Table:**

Entry	Project Entry Using...	Increase	Starting Year	Time Period		
				To End	Yrs	Cont. Proj.
→ \$ 324,000	Annual Compounding	→ 8.00%	Year 1	<input checked="" type="checkbox"/>	9	

Arrows point from the 'Annual Compounding' and '8.00%' cells in the table to the 'Projection Description' dialog box.

**Projection Description Dialog Box:**

Repairs & Maintenance  
 Entry Choice: \$ per Year  
 Year 1            \$324,000 per Year  
                          Compounding at 8.00% per year for next 8 years

Buttons: OK, Print Report, Help

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

Setting up Utilities

1. Select row 4 'Utilities'
2. Click on the Projection Wizard button and enter the following entries

The screenshot shows the 'Projection Wizard' window. It has two main sections: 'Entry Information' and 'Projection'.

**Entry Information:**  
 Description: Utilities  
 Entry Choice: \$ per Yr

**Projection:**

Entry	Project Entry Using...	Increase	Starting Year	Time Period		Cont. Proj.
				To End	Yrs	
→ \$ 190,000	Annual Compounding	→ 6.00%	Year 1	<input checked="" type="checkbox"/>	9	

Below the table is a 'Projection Description' dialog box with the following text:

```

Utilities
Entry Choice: $ per Year
Year 1      $190,000 per Year
            Compounding at 6.00% per year for next 8 years
    
```

Buttons in the dialog box include 'OK', 'Print Report', and 'Help'. At the bottom of the main window are buttons for 'New Projection', 'Insert Projection', 'Delete Projection', 'Delete All Projections', and 'Projection Description'. Arrows in the original image point from the 'Projection Description' button to the dialog box and from the 'To End' and 'Yrs' columns to the table row.

Setting up Insurance

1. Select row 5 'Insurance'
2. Click on the Projection Wizard button and enter the following entries

**Projection Wizard**

**Entry Information**

Description: Insurance  
Entry Choice: \$ per Yr

**Projection**

Entry	Project Entry Using...	Increase	Starting Year	Time Period		Cont. Proj.
				To End	Yrs	
→ \$ 35,000	Annual Compounding	→ 6.00%	Year 1	<input checked="" type="checkbox"/>	9	

**Projection Description**

Insurance  
Entry Choice: \$ per Year  
Year 1      \$35,000 per Year  
                  Compounding at 6.00% per year for next 8 years

Buttons: OK, Print Report, Help, New Projection, Insert Projection, Delete Projection, Delete All Projections, Projection Description

Setting up Selling expenses

1. Select row 6 'Selling expenses'
2. Click on the Projection Wizard button and enter the following entries

The screenshot displays the 'Projection Wizard' window. Under the 'Entry Information' tab, the 'Description' is 'Selling expenses' and the 'Entry Choice' is '% of Revenue(s)'. The 'Projection' section contains a table with the following data:

%	Project Entry Using...	Increase	Starting Year	Time Period		
				To End	Yrs	Cont. Proj.
10.00%	Constant (Fill Right)		Year 1	<input checked="" type="checkbox"/>	9	

An arrow points to the 'To End' checkbox in the table. Below the table is a 'Projection Description' dialog box with the following text:

Selling expenses  
 Entry Choice: % of Revenue(s)  
 Sales  
 Year 1            10.00% of Revenue(s)  
                       Constant per year for next 8 years

The dialog box has 'OK', 'Print Report', and 'Help' buttons. At the bottom of the main window are buttons for 'New Projection', 'Insert Projection', 'Delete Projection', 'Delete All Projections', and 'Projection Description'. An arrow points from the 'Projection Description' button to the dialog box.



**REVENUE Folder**

**Sales:** \$3,500,000 per year for the first year then increasing at 5.00% compounding per year

Set up the Revenue folder as follows

Project Info.		Investor	Investment	Working Capital	Expenses	Revenue
<b>Revenue</b>						
Description	Entry Choice	Qty	Category	Year 1 Jan...		
Sales ←	\$ per Yr ←	—	Common	\$ 0		

Setting up the Sales

1. Select row 1 'Selling expenses'
2. Click on the Projection Wizard button and enter the following entries

The screenshot shows the 'Projection Wizard' dialog box with the following details:

- Entry Information:**
  - Description: Sales
  - Entry Choice: \$ per Yr
- Projection Table:**

Entry	Project Entry Using...	Increase	Starting Year	To End	Yrs	Cont. Proj.
→ \$ 3,500,000	Annual Compounding	→ 5.00%	Year 1	<input checked="" type="checkbox"/>	9	
- Projection Description Dialog:**

Sales  
 Entry Choice: \$ per Year  
 Year 1        \$3,500,000 per Year  
                   Compounding at 5.00% per year for next 8 years
- Buttons:**
  - New Projection
  - Insert Projection
  - Delete Projection
  - Delete All Projections
  - Projection Description

**Financing Folder**

Description: Loan. Outstanding Balance

Type: Standard Mortgage

Amount: \$1,378,479 (The Outstanding Balance on the Analysis Start Date)

Time Period: 2 years

Amortization Period: 2 years (The remaining Amortization Period)

Interest Rate: 7.00% per year

Payments: Monthly

Make the following entries into the mortgage window

**Mortgage**

**Mortgage Details**

New Mortgage →  Mortgage already exists

Analysis Period: Year 1 Jan to Year 9 Dec

Commencing Year 1 Month January

Type Standard Mortgage ←

Amount → \$ 1,378,479 Interest Rate Fixed

Description Loan. Outstanding Balance ←

**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	→ 2	0	→ 2	0	→ 7.000%

Make the entries and then click on the Compute button

OK Compute Fill Down Cancel Help Comments

**SALVAGE VALUE Folder**

Existing Equipment: \$75,000

Make the following entries in the Salvage Value folder

Expenses Revenue Financing **Salvage Value**

**Disposition Costs**

Description	Entry Choice	Expense
Selling Expenses	% of Salvage Value	0.00%
Legal Fees	% of Salvage Value	0.00%
Removal Costs	Amount	\$ 0

Add Insert Delete Move

**Salvage Value**

Description	Capital Investment	Salvage Value
Existing Equipment	\$ 2,008,092	→ \$ 75,000
Major overhaul	\$ 100,000	\$ 0

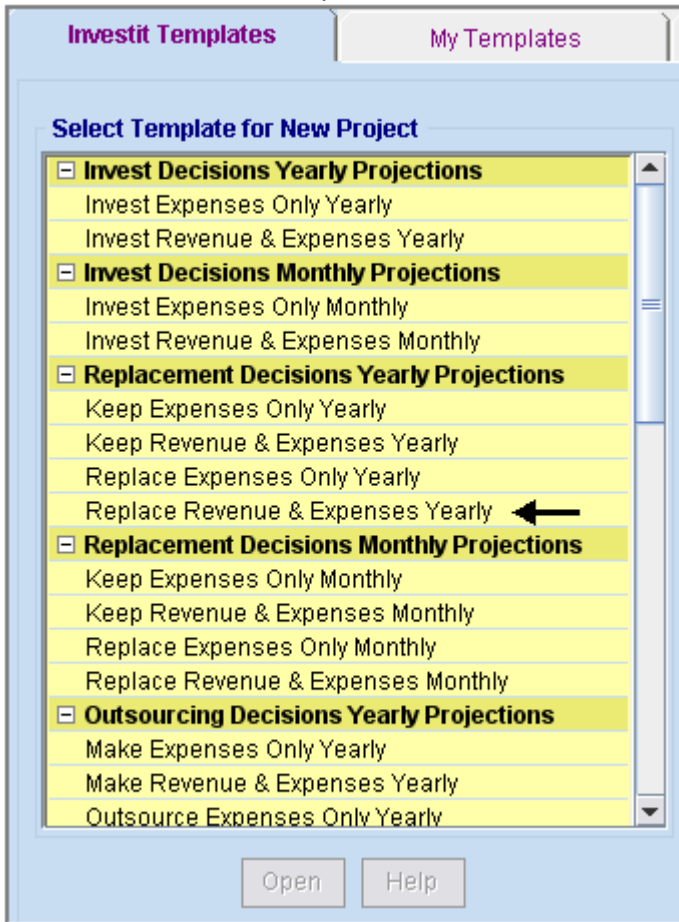
SAVE YOUR PROJECT

## INSTRUCTIONS FOR ENTERING THE “REPLACE” ANALYSIS

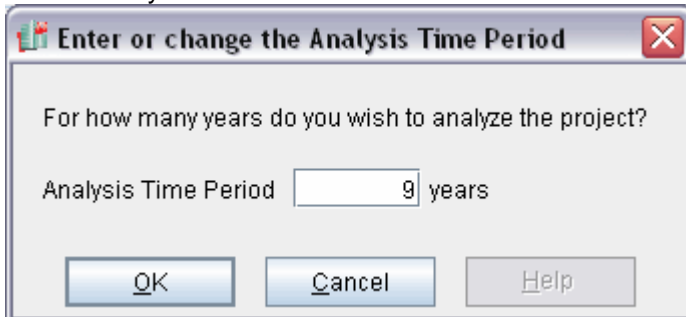
### Getting started

The first step is to open the Investit Decisions Template “Replace Revenue & Expenses Yearly” as follows:

1. Open Investit Decisions.
2. Select the Investit Templates folder



3. Select and open the Investit template “Replace Revenue & Expenses Yearly”. The analysis period dialog will open at this point.
4. Enter 9 years and click OK



**Entering the project data and information**

**Project Info Folder**

Project Name: Plastic Bottle Manufacturing Division  
 Project Description: Replace Equipment Analysis  
 Analysis Period: 9 years

Project Info.	Investor	Investment	Working Capital	Expenses
<b>Report Headers</b>				
Project Name	Plastic Bottle Manufacturing Division ←			
Project Description	Replace Equipment Analysis ←			
<b>Analysis Time Period</b>				
	9	Years	Change Analysis Time Period	
<b>Entry Information</b>				
Enter Revenue and Expenses	Yearly		Change Entry Information	
Starting Date	January Year 1			

**INVESTOR Folder**

Marginal Tax Rate (Including State Taxes): 35.00%  
 Capital Gain Rate: 35.00%  
 Recaptured Deprec. Rate: 35.00%  
 Desired Return or Discount Rate (Before Tax): 13.00%  
 Short Term Rates  
 Financing Rate: 8.00%  
 Reinvestment Rate: 2.50%

Project Info.	Investor	Investment	Working Capital	Expenses	Revenue
<input type="checkbox"/> Turn off Tax Calculations					
<b>Tax Rate</b>					
Investor's Marginal Tax Rate	35.00%				
Capital Gain Tax Rate	35.00%				
Recaptured Depreciation Tax Rate	35.00%				
<b>Discount Rate or Desired Return on Investment</b>					
Before Tax	→ 13.00%				
After Tax	→ 8.45%				
<b>Short Term Rates</b>					
<b>Before Tax</b>					
Financing Rate	→ 8.000%				
Reinvestment Rate	→ 2.500%				
<b>After Tax</b>					
Financing Rate	5.200%				
Reinvestment Rate	1.625%				

**INVESTMENT Folder**

New Equipment: \$11,000,000 Year 1 Jan  
 Depreciation: Personal Prop. St Line 200%

Salvage Value of Equipment being replaced  
 Before Tax: \$800,000  
 After Tax: \$740,000

Financing Repaid: \$1,378,479 (Repayment of outstanding balance for the bank loan for the preexisting equipment purchased 5 years ago)

Make the following entries in the Investment folder

Project Info.	Investor	Investment	Working Capital	Expenses	Revenue	Financing	Salvage Value
<b>Salvage Value of Equipment being replaced</b>							
Salvage Value (Before Tax)		→ \$ 800,000	Salvage Value (After Tax)		→ \$ 740,000	Financing Repaid → \$ 1,378,479	
<b>Investments</b>							
Inflate							
Description	Amount	Year	Month	Depreciation Method	Recovery Period [yrs]		
New Equipment	→ \$ 11,000,000	Year 1	Jan	Personal Prop. 200% DB	7.0		

**WORKING CAPITAL Folder**

Working Capital: \$90,000 Year 1 Jan

Make the following entries in the Working Capital folder

Project Info.	Investor	Investment	Working Capital	Expenses
<b>Working Capital</b>				
Description	Entry Choice			Year 1 Jan...
Working Capital	Add or Subtract (-) Working Capital			→ \$ 90,000

**EXPENSES Folder**

**Labor:** 20.00% of Revenue

**Materials:** 20.00% of Revenue

**Repairs & Maintenance:**

\$536,000 per year for the first year then increasing at 5.00% compounding per year

**Utilities:**

\$335,000 per year for the first year then increasing at 5.00% compounding per year

**Insurance:**

\$65,000 per year for the first year then increasing at 6.00% compounding per year

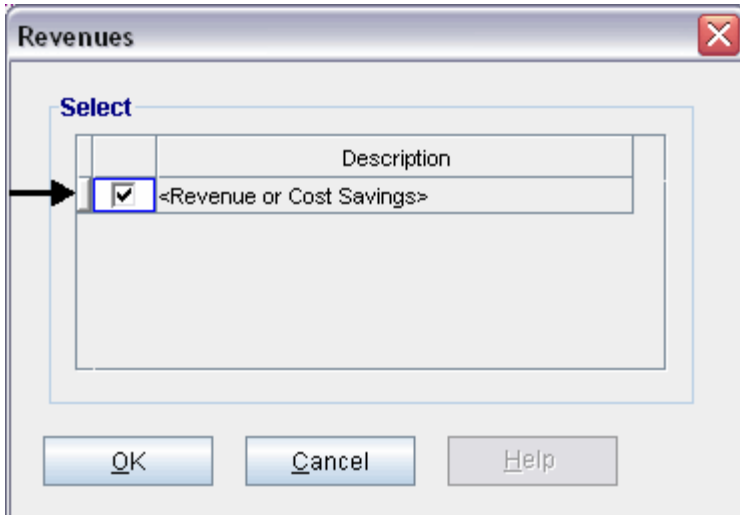
**Selling Expenses:** 10.00% of Revenue

Setting up the Expenses folder

1. Select row 7 'Rent' and click on the Delete button
2. Make the following changes to the Expenses folder

Project Info.	Investor	Investment	Working Capital	Expenses	
<b>Expenses</b>					
Description	Entry Choice	Qty	Category	Year 1 Jan...	
Labor	% of Revenue(s) ←	—	Common	0.00%	
Materials	% of Revenue(s) ←	—	Common	0.00%	
Repairs & Maintenance	\$ per Yr ←	—	Common	\$ 0	
Utilities	\$ per Yr ←	—	Common	\$ 0	
Insurance	\$ per Yr ←	—	Common	\$ 0	
Selling Expenses ←	% of Revenue(s) ←	—	Common	0.00%	

Fill out the % of Revenues windows as follows



Setting up Labor

1. Select row 1 'Labor'
2. Click on the Projection Wizard button and enter the following entries

**Projection Wizard**

**Entry Information**

Description: Labor

Entry Choice: % of Revenue(s)

**Projection**

%	Project Entry Using...	Increase	Starting Year	Time Period		
				To End	Yrs	Cont. Proj.
→ 20.00%	Constant (Fill Right)		Year 1	<input checked="" type="checkbox"/>	9	

**Projection Description**

Labor

Entry Choice: % of Revenue(s)

Sales

Year 1      20.00% of Revenue(s)

                 Constant per year for next 8 years

OK      Print Report      Help

New Projection      Insert Projection      Delete Projection

Delete All Projections      Projection Description



Setting up Materials

1. Select row 2 'Materials'
2. Click on the Projection Wizard button and enter the following entries

The screenshot displays the 'Projection Wizard' window. Under the 'Entry Information' tab, the 'Description' is 'Materials' and the 'Entry Choice' is '% of Revenue(s)'. The 'Projection' tab shows a table with the following data:

Time Period						
%	Project Entry Using...	Increase	Starting Year	To End	Yrs	Cont. Proj.
→ 20.00%	Constant (Fill Right)		Year 1	<input checked="" type="checkbox"/>	9	

An arrow points from the 'To End' checkbox in the table to the 'Projection Description' dialog box. The dialog box contains the following text:

Materials  
 Entry Choice: % of Revenue(s)  
 Sales  
 Year 1            20.00% of Revenue(s)  
                          Constant per year for next 8 years

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

Setting up Repairs & Maintenance

1. Select row 3 'Repairs & Maintenance'
2. Click on the Projection Wizard button and enter the following entries

The screenshot shows the 'Projection Wizard' application window. It has two main sections: 'Entry Information' and 'Projection'.

**Entry Information:**  
 Description: Repairs & Maintenance  
 Entry Choice: \$ per Yr

**Projection:**

Entry	Project Entry Using...	Increase	Starting Year	Time Period		Cont. Proj.
				To End	Yrs	
→ \$ 536,000	Annual Compounding	→ 5.00%	Year 1	<input checked="" type="checkbox"/>	9	

Below the table is a 'Projection Description' dialog box with the following text:

Repairs & Maintenance  
 Entry Choice: \$ per Year  
 Year 1           \$536,000 per Year  
                     Compounding at 5.00% per year for next 8 years

The dialog box has buttons for 'OK', 'Print Report', and 'Help'. At the bottom of the main window are buttons for 'New Projection', 'Insert Projection', 'Delete Projection', 'Delete All Projections', and 'Projection Description'. Arrows in the original image point from the 'Projection Description' button to the dialog box and from the 'To End' checkbox to the table row.

### Setting up Utilities

1. Select row 4 'Utilities'
2. Click on the Projection Wizard button and enter the following entries

The screenshot displays the 'Projection Wizard' software interface. At the top, the title bar reads 'Projection Wizard'. Below it, the 'Entry Information' section shows 'Description: Utilities' and 'Entry Choice: \$ per Yr'. The 'Projection' section contains a table with the following data:

Entry	Project Entry Using...	Increase	Starting Year	To End	Yrs	Cont. Proj.
→ \$ 335,000	Annual Compounding	→ 5.00%	Year 1	<input checked="" type="checkbox"/>	9	

Below the table is a 'Projection Description' dialog box with the following text:

Utilities  
Entry Choice: \$ per Year  
Year 1           \$335,000 per Year  
                    Compounding at 5.00% per year for next 8 years

The dialog box has buttons for 'OK', 'Print Report', and 'Help'. At the bottom of the main window, there are buttons for 'New Projection', 'Insert Projection', 'Delete Projection', 'Delete All Projections', and 'Projection Description'. Arrows in the image point from the 'Projection Description' button to the dialog box and from the 'Annual Compounding' and 'To End' cells of the table to the dialog box content.

Setting up Insurance

1. Select row 5 'Insurance'
2. Click on the Projection Wizard button and enter the following entries

The screenshot displays the 'Projection Wizard' window. Under the 'Entry Information' section, the 'Description' is 'Insurance' and the 'Entry Choice' is '\$ per Yr'. The 'Projection' section contains a table with the following data:

Entry	Project Entry Using...	Increase	Starting Year	Time Period		
				To End	Yrs	Cont. Proj.
\$ 65,000	Annual Compounding	6.00%	Year 1	<input checked="" type="checkbox"/>	9	

Below the table is a 'Projection Description' dialog box with the following text:

Insurance  
 Entry Choice: \$ per Year  
 Year 1 \$65,000 per Year  
 Compounding at 6.00% per year for next 8 years

The dialog box includes 'OK', 'Print Report', and 'Help' buttons. At the bottom of the main window are buttons for 'New Projection', 'Insert Projection', 'Delete Projection', 'Delete All Projections', and 'Projection Description'. Arrows in the image indicate the flow from the table row to the dialog box and from the dialog box to the 'Projection Description' button.

Setting up Selling Expenses

1. Select row 6 'Selling Expenses'
2. Click on the Projection Wizard button and enter the following entries

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

**Entry Information:**  
 Description: Selling expenses  
 Entry Choice: % of Revenue(s)

**Projection:**  
 A table with columns: %, Project Entry Using..., Increase, Starting Year, Time Period (To End, Yrs), and Cont. Proj. The first row is highlighted in yellow and contains the following data: 10.00%, Constant (Fill Right), [blank], Year 1, [checked], 9, [blank].

An arrow points from the 'To End' checkbox in the table to a 'Projection Description' dialog box. This dialog box contains the following text:  
 Selling expenses  
 Entry Choice: % of Revenue(s)  
 Sales  
 Year 1            10.00% of Revenue(s)  
                       Constant per year for next 8 years

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

**REVENUE Folder**

**Sales:** \$5,500,000 per year for the first year then increasing at 5.00% compounding per year

Set up the Revenue folder as follows

Project Info.		Investor	Investment	Working Capital	Expenses	Revenue
<b>Revenue</b>						
Description	Entry Choice	Qty	Category	Year 1 Jan...		
Sales ←	\$ per Yr ←	—	Common	\$ 0		

Setting up the Sales

1. Select row 1 'Selling expenses'
2. Click on the Projection Wizard button and enter the following entries

**Projection Wizard**

**Entry Information**

Description: Sales  
Entry Choice: \$ per Yr

**Projection**

Entry	Project Entry Using...	Increase	Starting Year	Time Period		
				To End	Yrs	Cont. Proj.
\$ 5,500,000	Annual Compounding	5.00%	Year 1	<input checked="" type="checkbox"/>	9	

**Projection Description**

Sales  
Entry Choice: \$ per Year  
Year 1 \$5,500,000 per Year  
Compounding at 5.00% per year for next 8 years

Buttons: OK, Print Report, Help, New Projection, Insert Projection, Delete Projection, Delete All Projections, Projection Description

**FINANCING Folder**

Description: Equipment Loan  
 Start Date: Year 1 January  
 Type: Standard Mortgage  
 Amount: \$6,000,000  
 Time Period: 7 years  
 Interest Rate: 9.00% per year  
 Payments: Monthly  
 Compounding Period: Monthly

Make the following entries into the Mortgage window

**Mortgage**

**Mortgage Details**

Analysis Period: Year 1 Jan to Year 9 Dec

Commencing Year 1 Month January

Type Standard Mortgage

Amount \$ 6,000,000 Interest Rate Fixed

Description Equipment Loan

**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	9.000%

Make the entries and click on the Compute button

OK Compute Fill Down Cancel Help Comments

**SALVAGE VALUE Folder**

New Equipment: \$1,000,000

Make the following entries into the Salvage Value folder

Working Capital	Expenses	Revenue	Financing	Salvage Value
<b>Disposition Costs</b>				
Description		Entry Choice	Expense	
Selling Expenses		% of Salvage Value	0.00%	
Legal Fees		% of Salvage Value	0.00%	
Removal Costs		Amount	\$ 0	
Add		Insert	Delete	Move
<b>Salvage Value</b>				
Description		Capital Investment	Salvage Value	
New Equipment		\$ 11,000,000	→ \$ 1,000,000	

**SAVE YOUR PROJECT**



## DECIDING BETWEEN “KEEP” & “REPLACE”

To decide between the two options use;

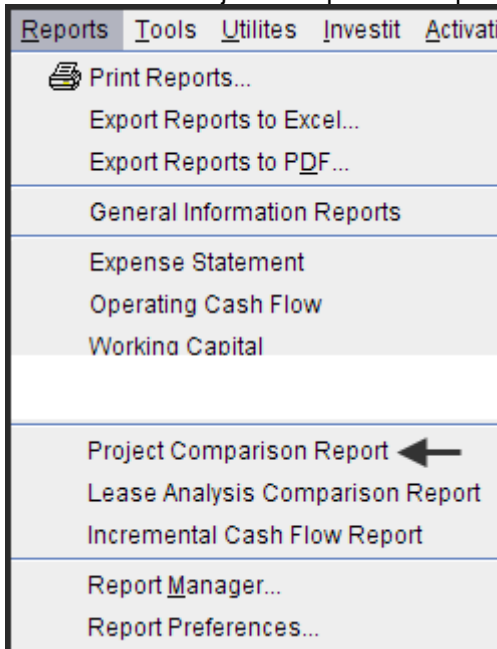
- a. The Project Comparison Report and
- b. The Incremental Cash Flow Report

### Project Comparison Report

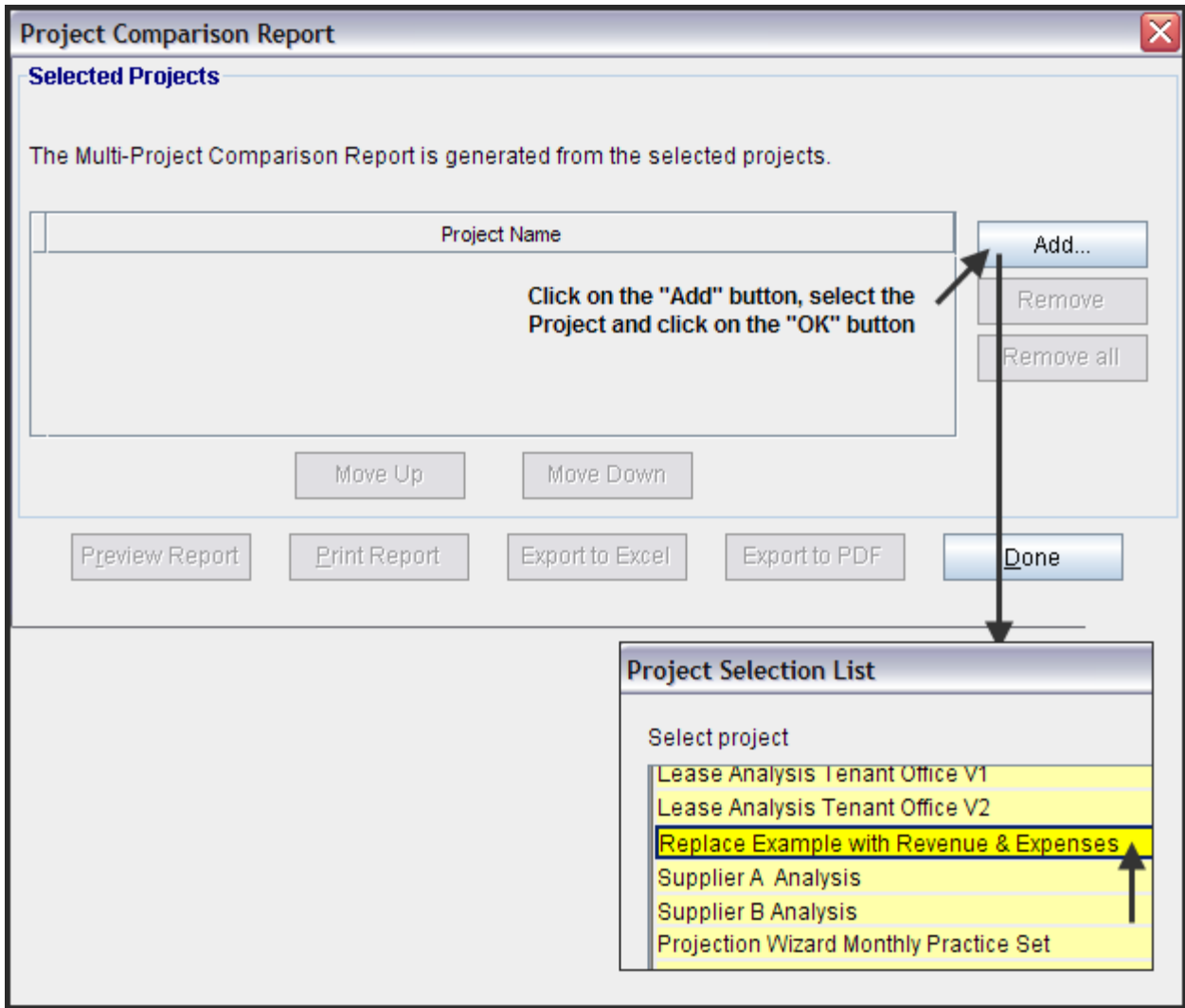
Up to four projects can be compared side by side.

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

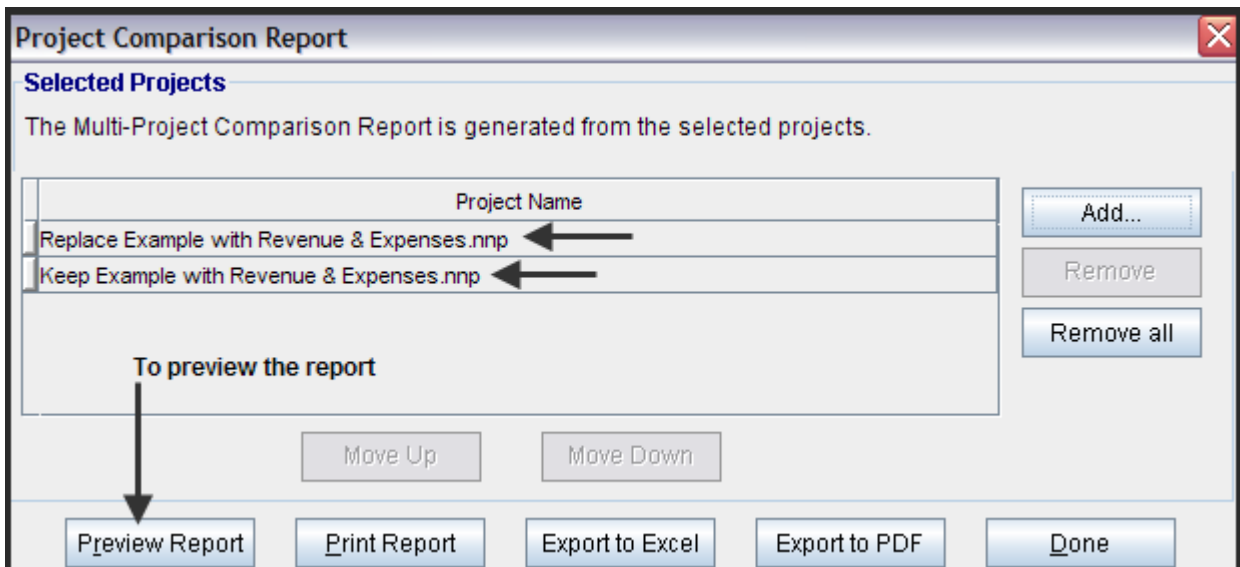
1. Select the Project Comparison Report on the Reports menu



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"



## Project Comparison Report

<b>Project Comparison Report (Before Tax)</b>			
Net Cash Flow( Before Tax)			
		Replace Example with Revenue & Expenses	Keep Example with Revenue & Expenses
Year	0	(5,668,479)	-
	1	565,586	(64,617)
	2	745,636	(42,787)
	3	840,149	619,839
	4	939,348	741,965
	5	1,043,461	764,139
	6	1,152,735	786,282
	7	1,267,422	808,303
	8	2,546,205	830,102
	9	3,852,539	926,566
	Total	7,294,604	5,369,792
Financial Return Before Tax			
Internal Rate of Return (IRR)		14.62%	246.54%
MIRR		10.39%	57.86%
Short term financing rate		8.000%	8.000%
Short term reinvestment rate		2.500%	2.500%
Net Present Value (NPV)	→	\$ 473,360 at 13.00%	→ \$ 2,550,627 at 13.00%
Annual Equivalency		\$ 92,243 at 13.00%	\$ 497,038 at 13.00%
Benefit to Cost Ratio		0.97 at 13.00%	86.39 at 13.00%
Payback Period (Years)		6.30	2.17
Discounted Pay Back Period (Years)		8.63 at 13.00%	2.21 at 13.00%

**Interpretation and decision using the “Comparison Report”**

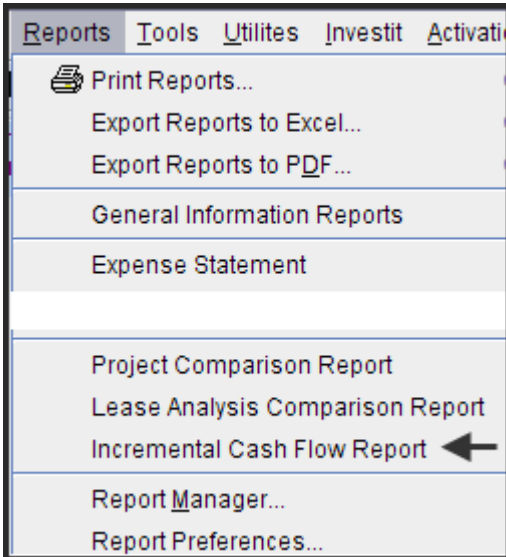
The “Keep” option is the best choice because the Net Present Value at 13.00% before tax is \$2,550,627 compared to \$473,360 for the Replace Option

## Incremental Cash Flow Report

When carrying out “Incremental Cash Flow Analysis” the largest investment goes first for the Incremental Cash Flow Report. In this case it is the Replace” option

Steps

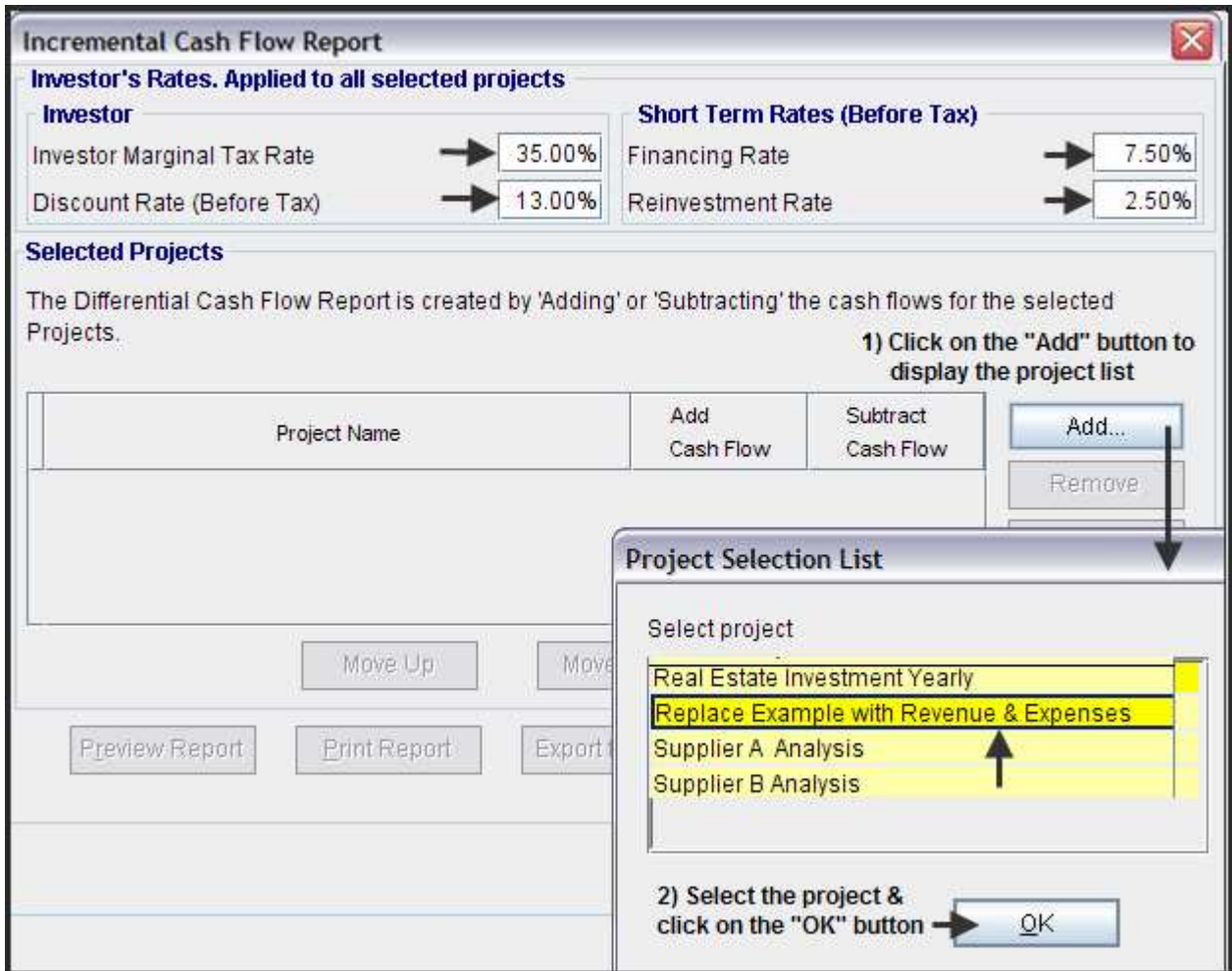
Select the Incremental Cash Flow on the Report menu



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 it 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:

### Incremental Cash Flow Report ✕

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

<p><b>Investor</b></p> <p>Investor Marginal Tax Rate <input style="width: 50px;" type="text" value="35.00%"/></p> <p>Discount Rate (Before Tax) <input style="width: 50px;" type="text" value="15.00%"/></p>	<p><b>Short Term Rates (Before Tax)</b></p> <p>Financing Rate <input style="width: 50px;" type="text" value="8.00%"/></p> <p>Reinvestment Rate <input style="width: 50px;" type="text" value="2.50%"/></p>
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**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	
Replace Example with Revenue & Expenses.nnp ←	→ <input checked="" type="radio"/>	<input type="radio"/>	Add...
Keep Example with Revenue & Expenses.nnp ←	<input type="radio"/>	→ <input checked="" type="radio"/>	Remove

**The Net Cash Flow for the "Keep" option will be subtracted from the Net Cash**

Move Up     Move Down

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

Net Cash Flow( Before Tax)		Incremental Cash Flow Report (Before Tax)		
		Plus	Minus	Incremental Net Cash Flow (Before Tax)
		Replace Example with Revenue & Expenses	Keep Example with Revenue & Expenses	
Year	0	(5,668,479)	-	(5,668,479)
	1	565,586	(64,617)	630,203
	2	746,636	(42,787)	788,423
	3	840,149	619,839	220,311
	4	939,348	741,965	197,384
	5	1,043,461	764,139	279,322
	6	1,152,735	786,282	366,453
	7	1,267,422	808,303	459,119
	8	2,546,205	830,102	1,716,103
	9	3,852,539	926,566	2,925,973
	Total	7,284,604	5,369,792	1,914,812
<b>Before Tax Financial Return</b>				
Internal Rate of Return (IRR)		→ 14.62%	→ 246.54%	→ 4.60%
Net Present Value (NPV) at 13.00%		→ \$ 473,360	→ \$ 2,550,627	→ (\$ 2,077,267)
Modified Internal Rate of Return (MIRR)		10.39%	57.86%	3.98%
Shortterm financing rate		8.00%	8.00%	8.00%
Shortterm reinvestment rate		2.50%	2.50%	2.50%
Annual Equivalency at 13.00%		\$ 92,243	\$ 497,038	(\$ 404,795)
Benefit to Cost Ratio at 13.00%		0.97	86.39	N/A
Payback Period		6.30 years	2.17 years	8.35 years
Discounted Pay Back Period at 13.00%		8.63 years	2.21 years	N/A

### Interpretation and decision using the “Incremental Cash Flow Report”

If the organization’s minimum acceptable rate of return (IRR) is 13.00% before tax, both the “Keep” and the “Replace” options seem to be acceptable because they both provide a return (IRR) higher than 13.00% before tax.

However, the return (IRR) on the incremental investment for “Keep” is 4.60% which is far below the minimum acceptable value of 13.00%. In this case the “Replace” option should be rejected and the ‘Keep” option accepted.

The other approach is to select the project with the highest Net Present Value (NPV), which is “Keep” option which has a Net Present Value at 13.00% before tax of \$2,550,627 compared to \$473,360 for the Replace option

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.