FINPLAN

Hands-on 2: FINPLAN Interface

Learning outcomes

By the end of this exercise, you will be able to:

1) Understand the FINPLAN interface.

2) Explain various streams/items of the FINPLAN interface.

3) Learn how to introduce data for a case study in FINPLAN.

4) Learn how to build a case study in FINPLAN.

Activity 1

Initial Data on a Coal Power Project

In this section, we will present the FINPLAN interface by building a case study for a power plant. This power plant is based on imported coal to be built in Malaysia. First, we describe the data related to the power plant.

Exchange rate	Ringgit/US$	3.2	
Plant size	MW	500	
Plant life	Year	30	
Capital cost	$/kW	1500	
Total investment	Million US$	750	
Local currency share	%	20	
Foreign currency share	%	80	
Local component of investment	Million US$	150	480 million Ringgit
Foreign component of investment	Million US$	600	

Base year	Year	2012	
Construction period	Year	4	
Start year	Year	2013	
Finish year	Year	2016	

Phasing of the investment	Foreign (%)	Local (%)
2013	10	30
2014	30	30
2015	40	20
2016	20	20

Phasing of the investment	Foreign (Million US $)	Local (Million
2013	60	144
2014	180	144
2015	240	96
2016	120	96
Total	600	480

The size of the power plant is 500 MW. Total investment requirement is 750 million US dollars. Plant machineries will be imported from the US, for which the payment will be made in US dollars. Financial analysis is carried out in the year 2012; therefore, the base year of the study is 2012.

Malaysian currency is the ringgit. The exchange rate in the base year is 3.2 Malaysian ringgit per dollar. 20% of the investment cost is a local component to be paid in local currency, whereas 80% of the cost is a foreign component. Therefore, the local component is 150 million US dollars, or 480 million Malaysian ringgits, which will be used to pay for land, civil works, utilities, connecting the power plant with the grid, etc. The foreign component is 600 million US dollars.

It will take four years to build the plant. Construction starts in 2013 and finishes in 2016. The plant goes online in 2017. The life of a plant is 30 years. Therefore, the plant operates till the year 2046.

Disbursement of investments, during the construction period, are displayed for both local and foreign components, in percentage terms as well as in absolute values.

As seen in the table below, the plant's capacity factor is 85%; thus, the plant generates 3,723 GWh. The plant's own consumption is 6% and net electricity available for sales is 3,499 GWh. Operating and maintenance cost is 10 dollar per MWh. As the plant generates 3,723 GWh annually, therefore, the annual operating and maintenance cost is 37.23 million US dollars, or in local currency, 119.13 million ringgits.

Operating and Maintenance Costs		
Unit size	MW	500
Capacity factor	%	85
Power generation	GWh	3723
Plant's own consumption	Fraction	0.06
Sales	GWh	3499.62
O&M cost	$/MWh	10
Annual O & M cost	Million US$	37.23
Annual O & M cost	Million Ringit	119.136

Regarding the fuel costs, the plant will import coal at a price of 110 US dollars per tonne. The calorific value of coal is 25.1 GJ/tonne. Thermal efficiency of the plant is 0.37. Therefore, heat rate is calculated as 9.73 MJ/kWh. Considering the calorific value of coal, coal consumption per kWh is 0.39 kg. As the plant generates 3,723 GWh/year, annual coal consumption in the plant is 1.4 million tonnes. Therefore, annual fuel cost is 158.7 million US dollars. This will remain in dollars as the plant has to make the payment in foreign currency.

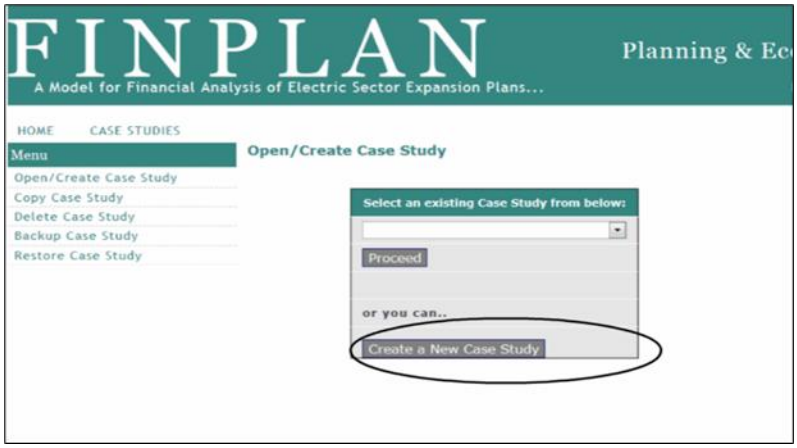
Fuelcosts data and calculations		
Coal price	US$/tonne	110
GCV of coal	GJ/Tonne	25.12
GCV of coal	MJ/kg	25.12
Plant size	MW	500
Capacity factor	%	85
Electricity generation	GWh/year	3723
Thermal efficiency	fraction	0.37
Heat rate	MJ/kWh	9.73
Coal consumption	kg/kWh	0.39
Total coal consumption	Million tonnes/year	1.442
Fuel cost	Million US$/year	158.7

Activity 2

Create a New Case Study in FINPLAN

We assume you have FINPLAN software working on your computer. Once you click the FINPLAN icon, this screen appears. Please click the start button.

Once you click the Start button, the following screen appears. On the left side, the menu offers several options like "Open/Create Case Study", "Copy Case Study", etc. Let us concentrate on the "Create Case Study" option, as we want to build a new case study. Another screen appears, which must be filled up.



Activity 3

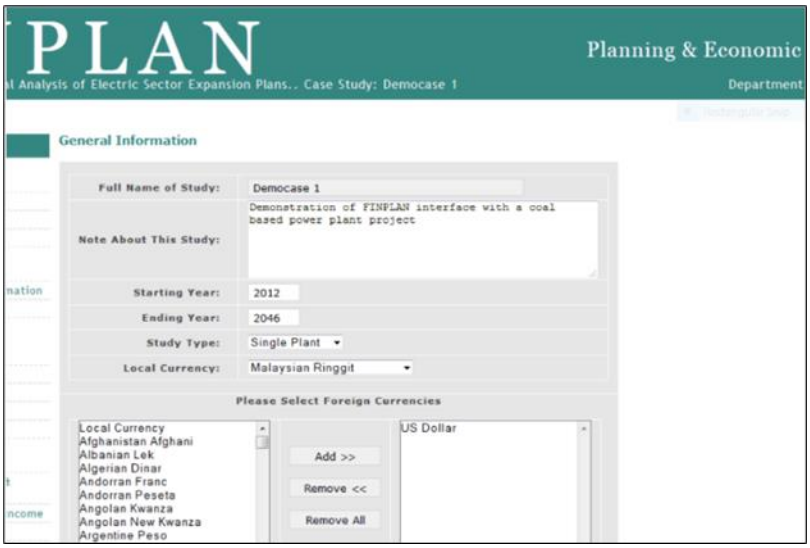
Describe the New Case Study in FINPLAN

In the box, "Full Name of Study", write the name of the case study, let's say "Democase 1". A short description about the study can be written in the box called "Note about the study". Here we have written "Demonstration of FINPLAN interface with a coal-based power plant project".

Then you need to choose the first year of the study, that is the year of the analysis, which is also the base year. We chose here 2012. The base year should preferably be a normal year, free from any major macro-economic and financial events. You need to define the study horizon by choosing the last year of the study that covers the analysis period. We chose here 2046 as the last year of the plant life.

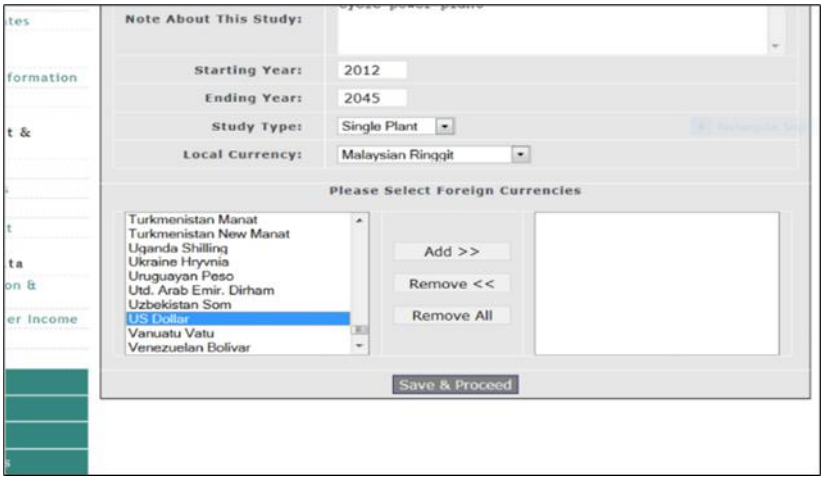
The next item regards study type, you can choose between "Single Plant" or "Utility". With FINPLAN, one can analyse the project financing, as well as corporate financing or balance sheet financing option, for financing a new project. These two types of financing mechanisms are

described in the lectures. Selecting "Single Plant", you choose a project financing option. By selecting "Utility", you choose the corporate financing option for financing a new project.



As FINPLAN carries out all computations in domestic currency, please choose your domestic currency. For the demonstration purpose, we chose here Malaysian Ringgit.

If you scroll down the same screen, you will see the option "Please Select Foreign Currencies". Most of the developing countries import major components of the power plant and need foreign currency to pay for that. Foreign currencies are obtained from the foreign sources through loans or by other means, and they also need to be repaid in foreign currency.

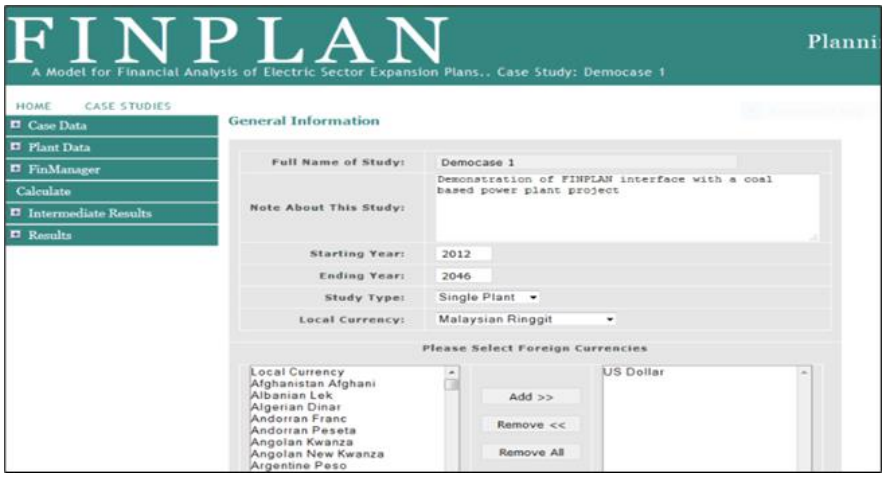


FINPLAN has provisions for foreign sources of financing. By clicking the currency and then the "Add" button, you can choose the foreign currency you want. We chose the foreign currency as "US Dollar". It is possible to select multiple foreign currencies. Afterwards, click the button "Save and Proceed" to save the data on the screen and move to the next screen. Do not forget to click the save button, otherwise you will lose your data.

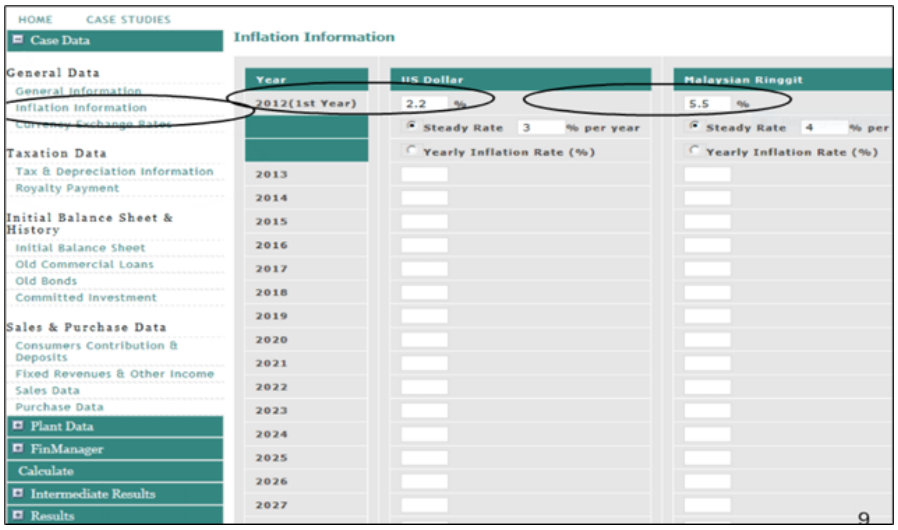
Activity 4

Introduce Case Data - Inflation

Now, if you look at the screen's left side, data inputs in FINPLAN are organized under three headings: "Case Data", "Plant Data", and "FinManager". Once you complete your data input, press the button "Calculate", this area will be explored further in later hands-on exercises. The results of the calculations can be seen under the heading "Results".



Since we have defined the case study, now we must fill in the other data. Under the "Case Data" menu, click the button "Inflation Information", where you need to provide current and future inflation information for domestic currency and all foreign currencies you have included for the analysis. Here, we have only one foreign currency, the US dollar, which has appeared side by side with the domestic currency. It should be noted that FINPLAN makes all calculations in domestic currency and current prices using inflation data.



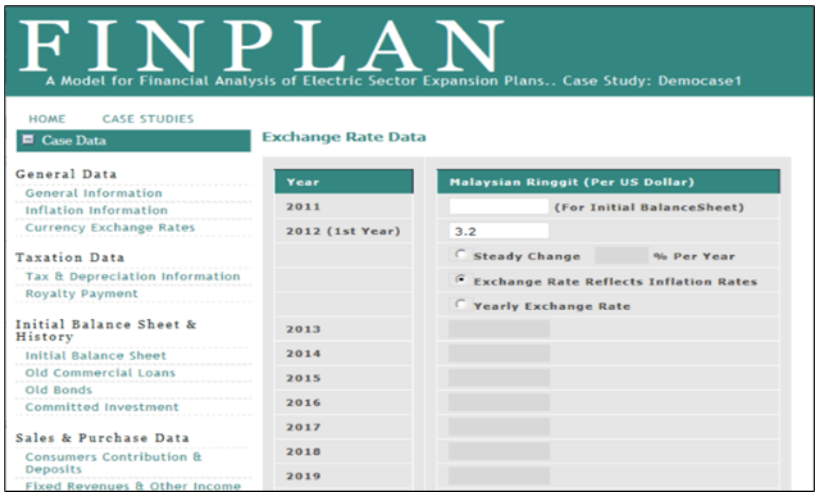
Inflation rate in percentage per year for the base year, which is 2012 in this case, needs to be filled up first, for both currencies. We have put respectively 2.2 and 5.5, which were the respective inflation rates in 2012 in the USA and Malaysia.

For future inflation rate, there are two options. Choose the "Steady Rate" option if future inflation rate remains constant per year over the study period. If the future inflation rate varies every year over the study period, then select "Yearly Inflation Rate" option. Once you click the "Yearly Inflation Rate" option, you can fill the future annual data on inflation rate in the empty boxes. Here we have chosen the "Steady Rate" option. Future inflation rate of the US dollar will remain constant at 3% per annum for the entire study period and for the domestic currency the figure is 4% per annum. Then click the button "Save and Proceed".

Activity 5

Introduce Case Data – Currency Exchange Rate

Next, by clicking the button "Currency Exchange Rates", the following window appears. FINPLAN makes all calculations for domestic currency using this exchange rate data. Here we have used only one foreign currency, US dollar; therefore, the exchange rate information for the US dollar in terms of the domestic currency, Malaysian ringgit, needs to be provided for the base year, as well as for future years. Exchange rate for the base year 2012 is 3.2.



For data on future exchange rate, there are three options:

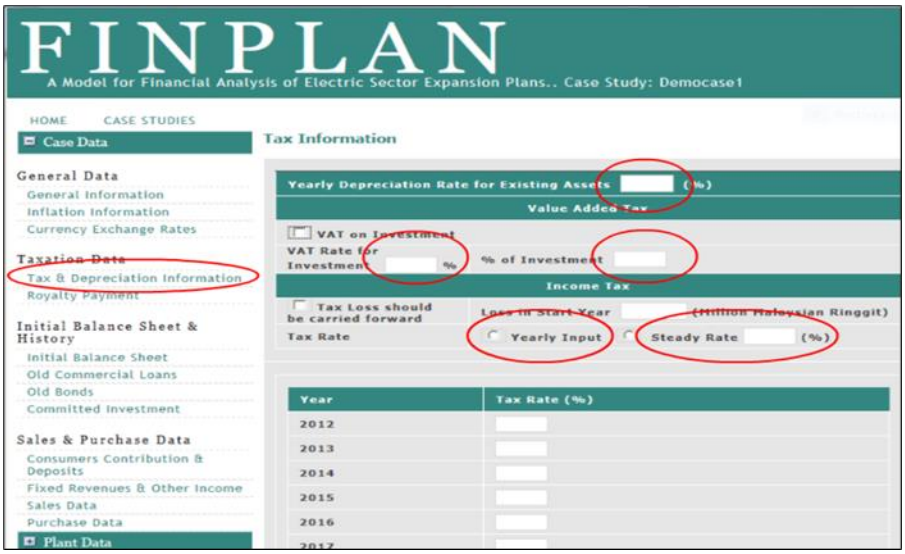
1. "Steady Change" in percentage per year, which means the foreign currency exchange rate will change at a constant percentage rate per year.
2. "Exchange Rate Reflects Inflation Rates" which implies exchange rate will appreciate or depreciate at the rate of difference between the inflation rates of foreign currency and domestic currency. In this case, future inflation rates for the dollar and ringgit are assumed as respectively constant at 3% and 4% per annum. Therefore, domestic currency will depreciate at the rate of 4 minus 3, that is 1% per year.
3. The third option is the "Yearly Exchange Rate". In case the user has a projection for the exchange rate for all future years, he/she can use this option.

Here, we chose the second option, that is "Future Exchange Rate Reflects the Inflation Rates".

Activity 6

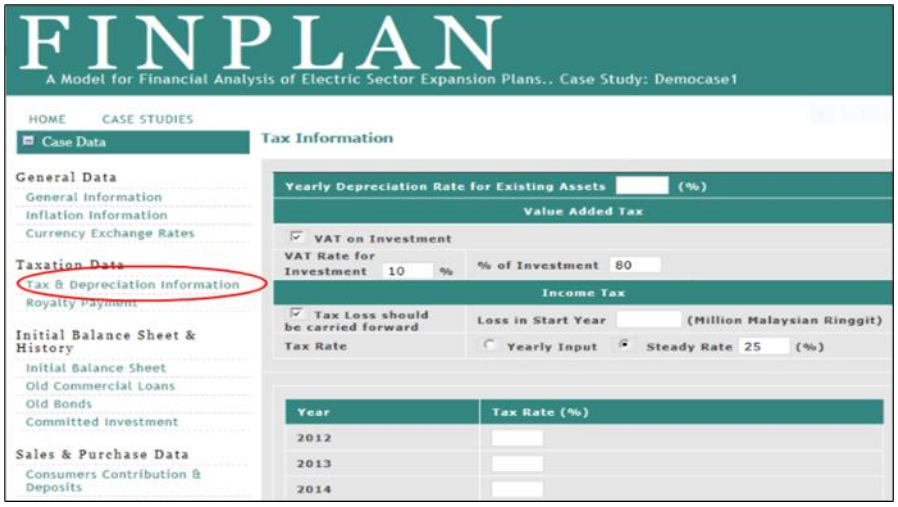
Introduce Case Data – Tax and Depreciation

The next set of data regards taxation. If you click the "Tax & Depreciation Information" button, the following screen appears. In case of balance sheet financing, the existing company has a balance sheet; therefore, data on the yearly depreciation rate of existing assets are required. However, for project financing, this is not needed as the company is new and there are no existing assets.



Most countries impose value added tax on purchase of equipment, materials, etc., which are the components of the investment of the construction of new power plants. If VAT is applicable, then please tick the box "VAT on Investment". Also provide the data on VAT rate. We assumed 10% as the VAT rate for Malaysia.

It is possible that VAT is not applicable to the entire investment amount. For example, some components can be exempted from VAT by the country's tax policy. In that case, please mention the percentage amount of investment under VAT. Here we assumed VAT is applicable to the 80% of the total investment expenses.



Tick "Tax loss should be carried forward" if your country allows this. What is tax loss to be carried forward will be explained later, while interpreting the results.

FINPLAN provides two options for the input of data on income tax or corporate tax: "Yearly Input", when tax rate varies from one year to another, and "Steady Rate", when tax rate remains the same

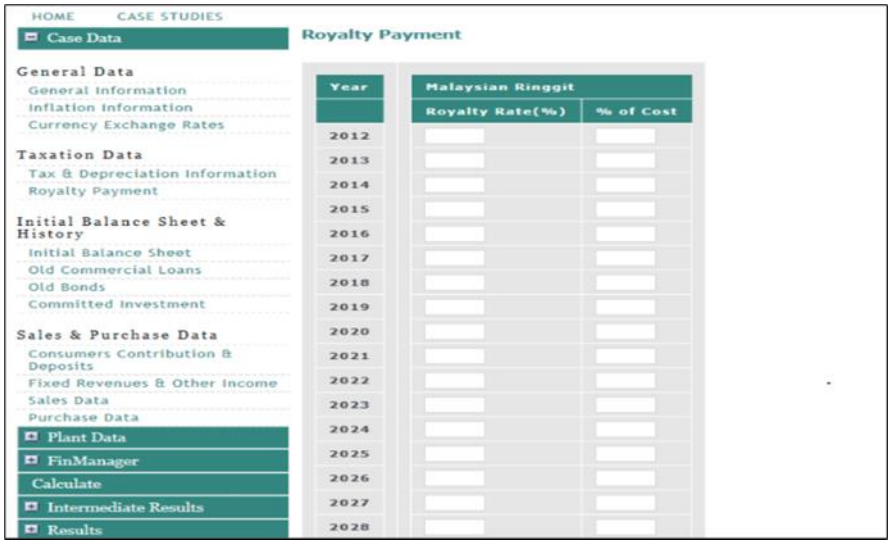
for all the years. If you click the "Yearly Input", then it allows you to fill the year-wise tax rate data. We chose the "Steady Rate" option and set the corporate tax rate as 25%, which is the current corporate tax rate in Malaysia.

Activity 7

Introduce Case Data – Royalty Payment

If you click on "Royalty Payment", this screen appears. Royalties are usage-based payments made by one party, the "licensee", to another, the "licensor", for the right to ongoing use of an asset. This could be an intellectual property, patent, trademark, copyrights, or even resource. Royalties are typically agreed upon as a percentage of gross or net revenues, derived from the use of an asset or a fixed price per unit sold of an item of such an asset, but there are also other modes and metrics of compensation.

FINPLAN allows two modes for royalty calculation. When only "Royalty Rate" is used, FINPLAN calculates royalty using royalty rate as percentage of total revenue.

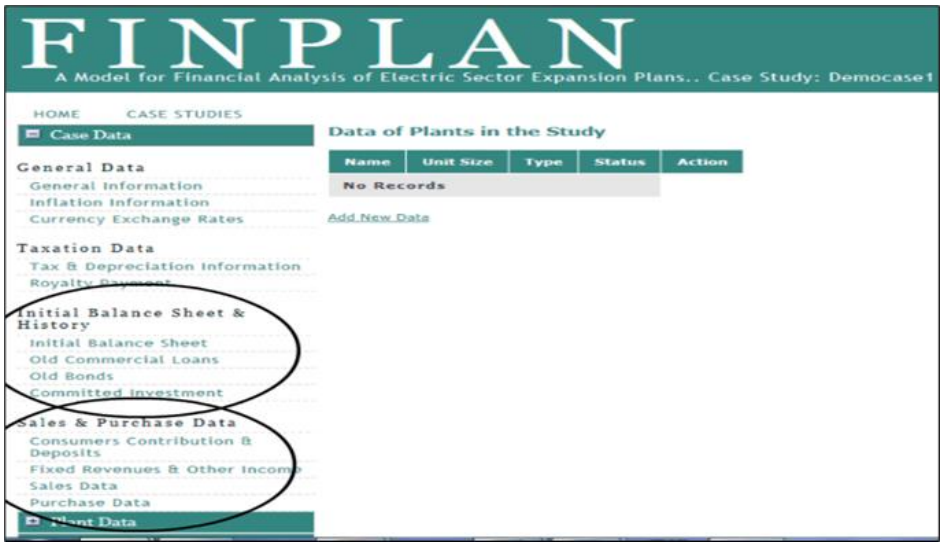


FINPLAN also can subtract a certain percentage of total operating cost from the revenue to calculate net revenue, and then royalty rate is applied to the net revenue to calculate the royalty. In that case, in addition to royalty rate, data on percentage cost are required. For this power plant, we assume royalty is not applicable.

Activity 8

Introduce Case Data – Initial Balance Sheet and History

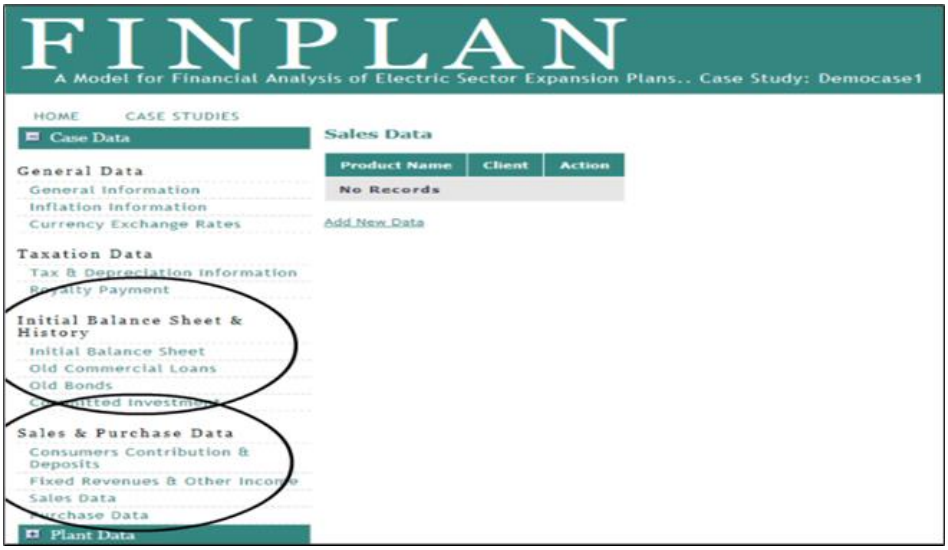
The next set of data regards the "Initial Balance Sheet and History". Since we are currently developing a project financing case, this is a new company and does not have an existing balance sheet. So, we skip this step.



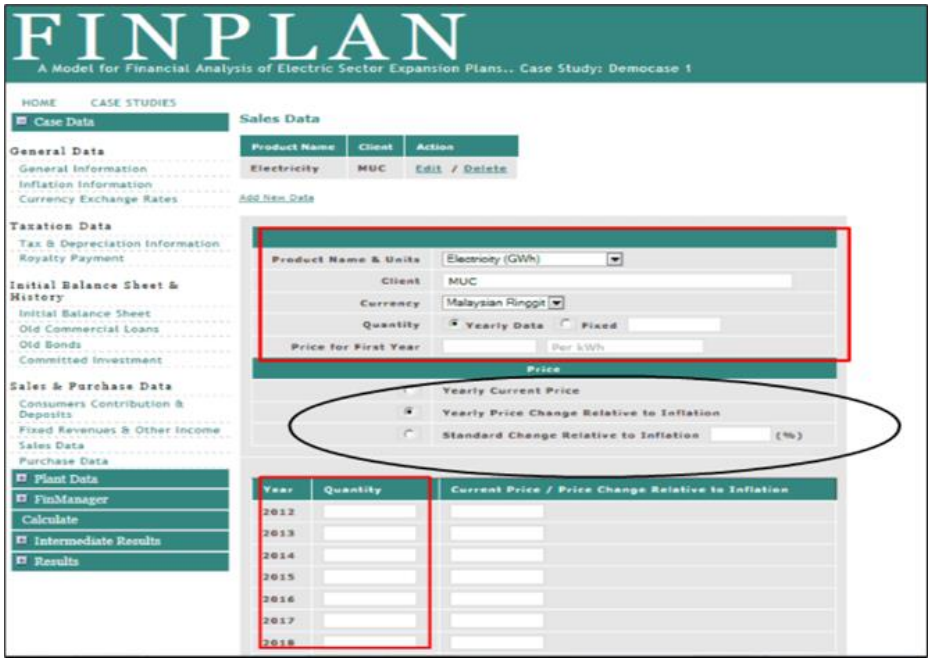
Activity 9

Introduce Case Data – Sales and Purchase Data

The next item is data related to "Sales & Purchase". Under this heading, the first component is "Consumers Contribution & Deposits". In some countries, consumers make a contribution to the cost of plant construction. Existing utilities can also have a large amount of consumers' deposit as security of connection. FINPLAN models consumers' contribution and deposits, and data are provided under "Consumers Contribution & and Deposits". However, since the current plant is built under a new project company like Independent Power Producer (IPP) and does not sell electricity directly to the consumers, the consumers' contribution is ignored. Plants may have sources of revenue other than from the electricity sales which could be included. However, in this case we ignore that. Next, we click on "Sales Data", and the following window appears.



If you click "Add New Data", the following screen appears, which we fill with data. The first data requirement is on the product name. FINPLAN allows it to model power plants producing various types of products in addition to electricity, such as water, heat, etc. For each of these products, one data screen needs to be defined. We chose only electricity here.

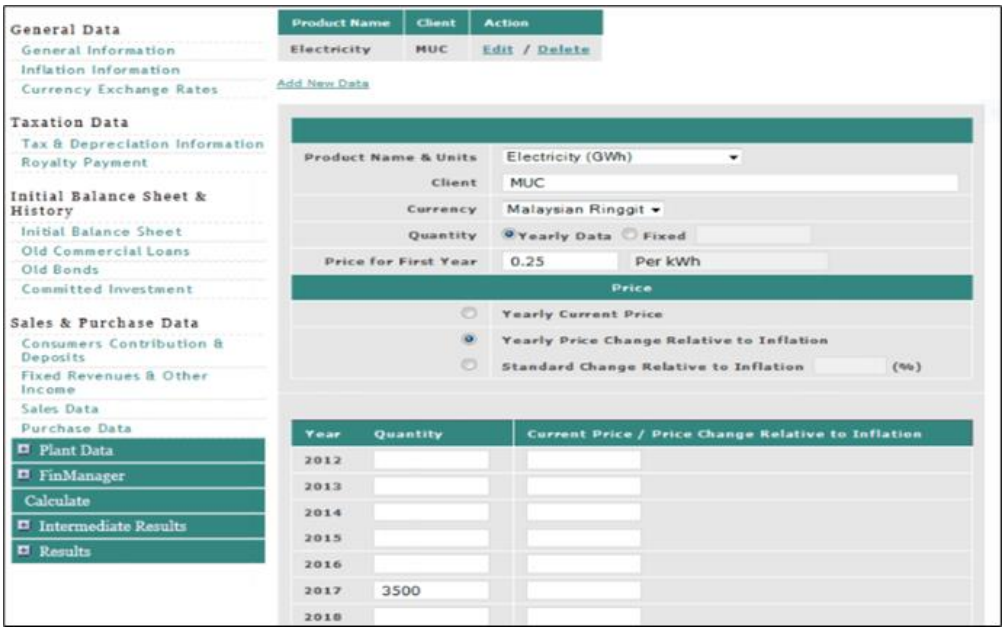


FINPLAN also allows Power plants to sell electricity to different customers at different quantities and prices; however, again for each customer, one data screen needs to be defined separately. We select one customer, the Malaysian Utility Company (MUC).

To reduce the exchange rate fluctuation risk, sometimes IPPs demand prices in foreign currency. Therefore, FINPLAN can represent electricity price in local as well as foreign currency. We chose the local currency ringgit.

The quantity of electricity to be sold can be presented as a fixed quantity or as yearly data when sales quantity varies from year to year. We suggest not to choose the fixed quantity as it creates some error. The fixed quantity can be dealt with through yearly data, just write the number for one year and FINPLAN recognises the quantity as the same for all years. Here we write the number for 2017, which is the first year of plant operation, and FINPLAN takes the same number for remaining years.

In the box "Price for First Year", input the price for the first year. When future price development is concerned, FINPLAN provides three options. The first option is "Yearly current price", when you have a projection for yearly future price. The second option is "Yearly price change relative to inflation". In this case, the price grows at the same rate as inflation. The third option is "Standard change relative to inflation". Normally electricity price increases at a lower rate than inflation. This can be captured by this option, allowing a difference in inflation rate between overall inflation and electricity price inflation to be defined.



Finally, under the "Quantity" column, data on annual quantity of electricity to be sold need to be entered. Here, the base price of electricity is 0.25 ringgit per kWh, and the second option is chosen for future price development. Annual quantity of electricity to be sold is 3,500 GWh, entered in 2017 which is the first year of plant operation. Then press the button "Save and Proceed".