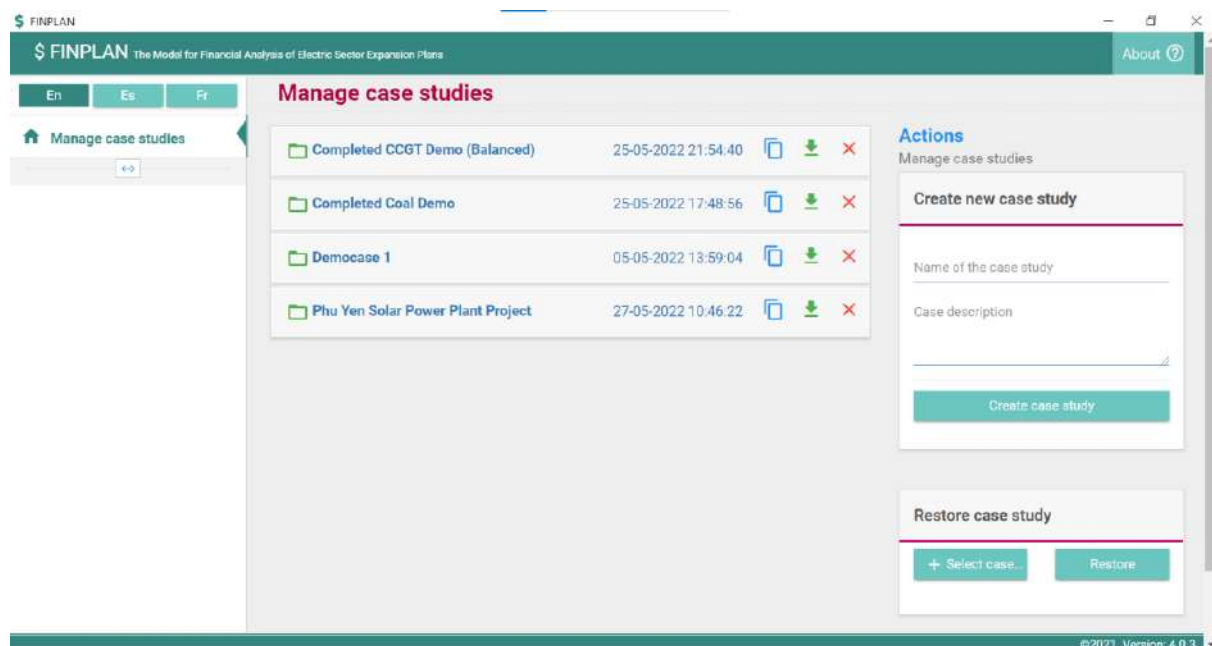


This document is meant to provide a concise introduction to FINPLAN, following the steps a user would need to take when setting up a FINPLAN case. It is thus closely aligned with the data entry and results structure of FINPLAN. This document is constantly being developed. Feedback is thus very welcome.

Should anything about this document be unclear or if you see room for improvement, please contact m.welsch@iaea.org

1. Manage case studies

On this page, you can create a new case study by typing its name and a description of the study in the box on the right. Once you have entered your details and clicked on “Create case study”, your new case study will show on the screen, in the middle. You can also copy (blue button), backup (green button), and delete (red button) your case study with the buttons alongside your case study name. Note that for renaming a case study, you have to open it and change the name under General information.



2. Case data

2.1. General data

General information

This page allows you to change the name of your case study and enter the start and end year of the analysis, currencies, and the study type. The start year should be before the first construction year. The end year is the end of the financial analyses, e.g., the end of the lifetime of the project. Notes about the study can also be entered here. Using notes to provide a short description of the analysis is very useful when working with multiple case studies, especially when dealing with minor modifications for a sensitivity analysis.

The screenshot displays the FINPLAN software interface. The top bar shows the application name and version. The left sidebar contains navigation icons and labels. The main content area is titled 'General data' and has three tabs: 'General information', 'Inflation information', and 'Currency exchange rates'. The 'General information' tab is selected, showing a form with the following fields:

- Name of the case study:** Test
- Start year:** 2022
- End year:** 2022
- Study type:** Single Plant
- Case description:** (empty text area)
- Local Currency:** (dropdown menu)
- Foreign Currencies (Drag & Drop):** A list of currencies including Afghanistani Afghani, Albanian Lek, Algerian Dinar, Angolan Kwanza, Angolan New Kwanza, Argentine Peso, Armenian Dram, and Aruban Florin.

Inflation information

This page allows the entering of inflation rates for all currencies by either selecting a steady rate or entering yearly values.

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The screenshot shows the FINPLAN software interface. The left sidebar contains a menu with options: Manage case studies, Case data (selected), General data, Taxation data, Initial balance sheet, Sales and purchase data, Plant data, Financial manager, Calculate, Intermediate results, and Results. The main window is titled 'General data' and shows the case study name 'Phu Yen Solar Power Plant Project'. The 'Inflation information' tab is active, displaying two sections: 'US Dollar (%)' and 'Vietnamese Dong (%)'. Each section has radio buttons for 'Steady Rate' and 'Yearly Input', with 'Yearly Input' selected. Below these is a table showing inflation rates for the years 2018 to 2023.

Year	US Dollar (%)	Vietnamese Dong (%)
2018	2.440	3.540
2019	1.810	2.800
2020	1.230	3.220
2021	4.700	1.830
2022		
2023		

Currency exchange rates

This page serves to enter exchange rates to the local currency, either as a steady rate or by defining yearly exchange rates. A third and commonly used option is to select that exchange rates reflect inflation rates.

The screenshot shows the FINPLAN software interface with the 'Currency exchange rates' tab active. It displays radio buttons for 'Vietnamese Dong (US Dollar) (%)' with options: 'Steady Rate', 'Exchange Rate Reflects Inflation Rates' (selected), and 'Yearly Exchange Rate'. Below is a table showing exchange rates for the years 2017 to 2021.

Year	Vietnamese Dong (US Dollar)
2017 (for initial ...)	22,370.090
2018 (start year)	22,602.050
2019	
2020	
2021	

2.2. Taxation data

Tax and depreciation information

On this page, you can provide information for: (1) Depreciation Rate for Assets; (2) Value Added Tax; and (3) Income Tax.

Depreciation Rate for Assets: The user may enter a depreciation rate for assets from before the modelling period if historical assets should be considered and are entered under “Case data – Initial balance sheet”. The depreciation method applied is declining balance depreciation.

Value Added Tax: The user can define if VAT needs to be paid on investments during the construction phase, which is then refunded once the plant goes into operation. The VAT rate entered is applied to a user-defined percentage of the investment.

Income Tax: A constant or yearly tax rate can be entered that is applied to the taxable income. FINPLAN allows carrying tax losses without a time limit. This means that losses in earlier years are subtracted from the taxable income in future years to reduce the income tax that needs to be paid. This is done until the cumulative taxable income exceeds the cumulative losses of earlier years. If a loss is entered for the start year, it will be included in this.

The screenshot displays the FINPLAN software interface. The sidebar on the left contains navigation links: 'En', 'Es', 'Fr', 'Manage case studies', 'Case data', 'General data', 'Taxation data', 'Initial balance sheet', 'Sales and purchase data', 'Plant data', 'Financial manager', 'Calculate', 'Intermediate results', and 'Results'. The main window is titled 'Taxation data' and has two tabs: 'Tax and depreciation information' (active) and 'Royalty payment'. The 'Tax and depreciation information' tab contains the following fields and options:

- Declining Balance Depreciation Rate for Assets of 2021 (%)**: A text input field.
- Value Added Tax**:
 - ☐ VAT on Investment
 - VAT Rate for Investment (%)**: A text input field.
 - % of Investment**: A text input field.
- Income Tax**:
 - ☐ Tax Loss should be carried forward
 - Loss in Start Year (Million)**: A text input field.
 - Tax rate**: Radio buttons for 'Yearly Input' and 'Steady Rate (%)'. Below 'Steady Rate (%)' is a text input field.

A note at the bottom states: 'A value entered for one year will also be applicable for subsequent years, until a new value is entered for a future year.' Below this is a table with columns 'Year' and 'Tax rate (%)'. The first row shows '2022' and '0'. The footer of the window reads '©2021. Version: 4.0.3'.

Royalty payment

This page allows you to enter royalty payments by defining a royalty rate and a percentage of the costs. This can be used to enter payments to an owner for the use of property, especially patents, copyrighted works, franchises, or natural resources.

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Taxation data

Name of the case study **test**

Tax and depreciation information **Royalty payment**

Royalty payment

A value entered for one year will also be applicable for subsequent years, until a new value is entered for a future year.

Year	Royalty Rate (%)	% of Cost
2022		

Data notes

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2.3. Initial balance sheet

Assets and liabilities

In this category, the initial balance sheet for a utility can be entered. Note that the user needs to ensure that the sum of all assets listed, less accumulated depreciation and consumer contribution, need to match the sum of all equity and liabilities.

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Initial balance sheet

Name of the case study **test**

Assets and liabilities

Old commercial loans Old bonds data Committed investment data

Assets (Million local currency)	Equity and Liabilities (Million local currency)
Gross Fixed Assets	Equity
Less: Accumulated Depreciation	Retained Earning
Less: Accumulated Consumer Contribution	Net Bonds Outstanding
Net Fixed Assets	Net Loans Outstanding
Work in Progress	Consumer Deposits
Receivables (including VAT)	Current Maturity

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Old commercial loans

This page allows you to enter outstanding loans and committed loan drawdowns in all currencies. Note that all outstanding loans and committed loan drawdowns need to match the sum of the repayments. The user can enter an average interest rate which will be used to calculate the interest.

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Alternatively, the interest to be paid can be defined by the user by entering yearly interest payments.

Initial balance sheet
Name of the case study **Phu Yen Solar Power Plant Project**

Assets and liabilities **Old commercial loans** Old bonds data Committed investment data

Old commercial loans

US Dollar (Million)
Outstanding loans
☐ Average Return Rate
☐ Yearly Return Payment

Vietnamese Dong (Million)
Outstanding loans
☐ Average Return Rate
☐ Yearly Return Payment

A value entered for one year will also be applicable for subsequent years, until a new value is entered for a future year.

Year	US Dollar (Million)			Vietnamese Dong (Million)		
	Committed Drawdown	Repayment	Investment	Committed Drawdown	Repayment	Investment
2018						
2019						
2020						
2021						

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Old bonds data

This page allows you to enter outstanding and committed bonds in all currencies. Note that all outstanding and committed bonds need to be listed as repayment at one stage. The user can enter an average return rate which will be used to calculate the interest. Alternatively, the interest to be paid can be defined by the user by entering yearly return payments. To ensure that the assets equal the equity and liabilities, i.e., to balance the balance sheet, the same amount needs to be added to the list of assets in the left column at “Case data – Initial balance sheet”.

Initial balance sheet
Name of the case study **Phu Yen Solar Power Plant Project**

Assets and liabilities Old commercial loans **Old bonds data** Committed investment data

Old bonds data

US Dollar (Million)
Outstanding loans
☐ Average Interest Rate
☐ Yearly Interest Payment

Vietnamese Dong (Million)
Outstanding loans
☐ Average Interest Rate
☐ Yearly Interest Payment

A value entered for one year will also be applicable for subsequent years, until a new value is entered for a future year.

Year	US Dollar (Million)			Vietnamese Dong (Million)		
	Committed Issue	Repayment	Return	Committed Issue	Repayment	Return
2018						
2019						
2020						
2021						

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Committed investment data

This page serves to enter committed future investments for all currencies that are unrelated to the power plants modelled but required to provide a holistic picture of a utility's investment portfolio.

The screenshot shows the 'Initial balance sheet' section of the FINPLAN software. The 'Committed investment data' tab is selected. The interface includes a sidebar with navigation options like 'Manage case studies', 'Case data', 'General data', 'Taxation data', 'Initial balance sheet', 'Sales and purchase data', 'Plant data', 'Financial manager', 'Calculate', 'Intermediate results', and 'Results'. The main area displays a table for entering committed investments from 2018 to 2027, with columns for 'US Dollar' and 'Vietnamese Dong'. A note states: 'Note that it is assumed that inflation/escalation is already accounted for. Therefore, committed investments need to be entered in nominal terms in the year of expenditure.'

Year	US Dollar	Vietnamese Dong
2018		
2019		
2020		
2021		
2022		
2023		
2024		
2025		
2026		
2027		

2.4. Sales and purchase data

Sales data

On this page, you are required to specify the sales from the project. Click on the green '+' symbol to add an entry. To edit an entry, click on the blue pencil icon. Different entries for different clients and with different prices are possible. Prices can either be constant or increase at a fixed or yearly rate that is added (or subtracted if a negative value is entered) to inflation. Please specify the sales only from the year that the plant goes into operation onwards.

The screenshot shows the 'Sales and purchase data' section of the FINPLAN software. The 'Sales data' tab is selected. The interface includes a sidebar with navigation options. The main area displays a table for entering sales data. A note states: 'Note that it is assumed that inflation/escalation is already accounted for. Therefore, committed investments need to be entered in nominal terms in the year of expenditure.'

Product name and units	Client	Currency	Quantity	Price for first year
Electricity(GWh)	EVN	Vietnamese Dong	YR	2168.97

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Sales and purchase data

Name of the case study **Phu Yen Solar Power Plant Project**

Sales data Purchase data Consumers contribution and deposits Fixed revenues and other income

Sales data

Product name and units	Client	Currency	Quantity	Price for first year
Electricity(GWh)	EVN	Vietnamese Dong	YR	2168.97

Details

Product name and units: Electricity (GWh) Client: EVN Currency: Vietnamese Dong

Quantity: ☒ Yearly data ☐ Fixed

Price: ☐ Yearly current price ☐ Yearly price change in addition to

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Purchase data

Like sales data, this category serves to specify any purchases of, e.g., electricity. Click on the green '+' symbol to add an entry. To edit an entry, click on the blue pencil icon.

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Sales and purchase data

Name of the case study **Phu Yen Solar Power Plant Project**

Sales data **Purchase data** Consumers contribution and deposits Fixed revenues and other income

Sales data

Product name and units	Client	Currency	Quantity	Price for first year
------------------------	--------	----------	----------	----------------------

Details

Product name and units: Client: Currency:

Quantity: ☐ Yearly data ☐ Fixed

Price: ☐ Yearly current price ☐ Yearly price change in addition to

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Sales and purchase data

Name of the case study **Phu Yen Solar Power Plant Project**

Sales data **Purchase data** Consumers contribution and deposits Fixed revenues and other income

Sales data

Product name and units	Client	Currency	Quantity	Price for first year
Electricity (GWh)		Vietnamese Dong		

Details

Product name and units: Electricity (GWh)

Client:

Currency: Vietnamese Dong

Quantity

☒ Yearly data ☐ Fixed

Price

☒ Yearly current price ☐ Yearly price change in addition to inflation (%) ☐ Standard change in addition to

Price for first year (Vietnamese Dong per

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Consumers contribution and deposits

This page allows you to enter a financial contribution to the asset (e.g., for preferential treatment regarding electricity sales). In the balance sheet, the contribution thus decreases the net fixed assets owned by the utility. The contribution is not tied to any profit or dividends. A consumer deposit is a deposit paid by consumers, e.g., for receiving the meter. Unlike the consumer contribution, it is listed as a liability (not an asset) on the balance sheet. In the statement showing cash inflows and outflows, both will be added to the short-term deposit. In FINPLAN is not expected that consumer contributions or deposits will ever be paid back.

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Sales and purchase data

Name of the case study **Phu Yen Solar Power Plant Project**

Sales data Purchase data **Consumers contribution and deposits** Fixed revenues and other income

Consumers contribution and deposits

A value entered for one year will also be applicable for subsequent years, until a new value is entered for a future year.

Year	Contribution	Deposits
2018		
2019		
2020		
2021		
2022		
2023		
2024		
2025		
2026		
2027		

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Fixed revenues and other income

This page allows you to enter continuous revenue streams that are independent of electricity sales and increase with a specified growth rate. Note that this growth rate is applied to the very first year of the modelling period.

The screenshot displays the FINPLAN software interface. The title bar reads '\$ FINPLAN The Model for Financial Analysis of Electric Sector Expansion Plans'. The main menu on the left includes: En, Ea, Fr, Manage case studies, Case data (selected), General data, Taxation data, Initial balance sheet, Sales and purchase data (highlighted), Plant data, Financial manager, Calculate, Intermediate results, and Results. The 'Sales and purchase data' section is active, showing tabs for Sales data, Purchase data, Consumers contribution and deposits, and Fixed revenues and other income (selected). The case study name is 'Phu Yen Solar Power Plant Project'. The 'Fixed revenues and other income' form contains the following fields: Fixed revenues initial year (Million Vietnamese Dong), Fixed Revenues Growth Rate (%), Other income initial year (Million Vietnamese Dong), and Other Income Growth Rate (%). Each field has a corresponding input line. There is a green '+' icon and a yellow '?' icon in the top right of the form area. A 'Data notes' section is at the bottom. The footer indicates '©2021, Version: 4.0.3'.

3. Plant data

On this page, you will see a green '+' symbol. You are required to click on this symbol to add the general plant data related to your project. Here, basic plant data such as type of plant, unit size and the first operational year are entered. When selecting existing under ownership, the first operational year should be set as equal to the starting year entered under "Case data - General data" and the construction period should be set as equal to zero. For existing plants, FINPLAN will not request any investment costs to be entered. Future and committed plants are treated equally. To edit a plant, click on the blue pencil icon.

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Plant data
Name of the case study **Phu Yen Solar Power Plant Project**

	Name	Plant type	Status	Ownership	Unit size	First operational year	Construction period	Plant life in years	Product type
	Phu Yen Solar Power Plant	Other Renewables	Future	Utility	257	2019	1	20	E

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FINPLAN The Model for Financial Analysis of Electric Sector Expansion Plans

Plant data

Name: Phu Yen Solar Power Plant

First operation year: 2019

Plant type: Other Renewables

Construction period: 1

Status: Future

Plant life in years: 20

Ownership: Utility

Product: ☒ Electricity, ☐ Heat, ☐ Water, ☐ CO2

Unit size (MW): 257

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3.1. Plant production

This page allows you to enter the quantity of output that is generated by the plant. Note that the values entered are not used for any calculations in FINPLAN but are just entered to characterise the plant. The user needs to assure that the quantity of all sales entered under “Case data – Sales and purchase data” corresponds to the sum across all plants entered under “Plant data”.

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The screenshot shows the FINPLAN software interface. The top bar displays the logo and title 'FINPLAN The Model for Financial Analysis of Electric Sector Expansion Plans'. The left sidebar contains a navigation menu with options like 'Manage case studies', 'Case data', 'Plant data', 'Financial manager', 'Calculate', 'Intermediate results', and 'Results'. The main window is divided into tabs: 'Plant data', 'Plant production' (selected), 'O & M costs', 'Fuel cost', 'General expenses data', 'Investments', 'Sources of financing', 'Depreciation', and 'Decommissioning'. The 'Plant production' tab is active, showing a table for 'Electricity (GWh)' from 2019 to 2030. The first row for 2019 has a value of 320,000. A note above the table states: 'A value entered for one year will also be applicable for subsequent years, until a new value is entered for a future year.'

Year	Electricity (GWh)
2019	320,000
2020	
2021	
2022	
2023	
2024	
2025	
2026	
2027	
2028	
2029	
2030	

3.2. O & M costs

This page allows you to enter the related yearly costs in all currencies defined under “Case data – General data”.

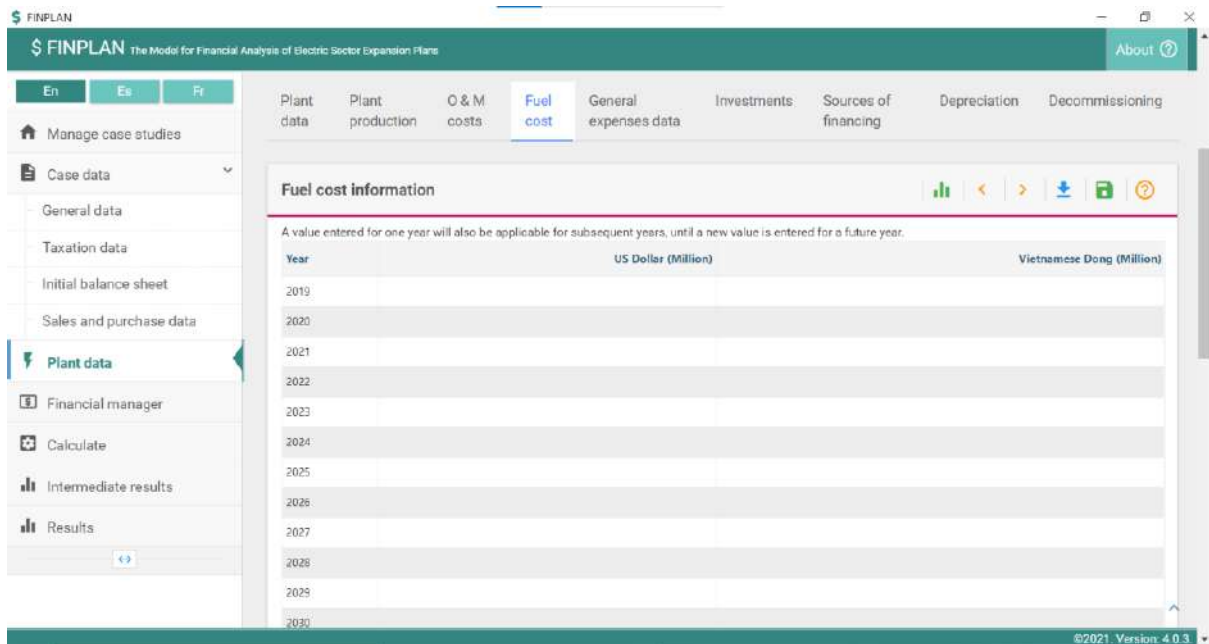
The screenshot shows the FINPLAN software interface with the 'O & M costs' tab selected. The main window displays a table for 'Operation & Maintenance costs' from 2019 to 2030. The table has two columns: 'US Dollar (Million)' and 'Vietnamese Dong (Million)'. The first row for 2019 has a value of 14,000 in the US Dollar column. A note above the table states: 'A value entered for one year will also be applicable for subsequent years, until a new value is entered for a future year.'

Year	US Dollar (Million)	Vietnamese Dong (Million)
2019	14,000	
2020		
2021		
2022		
2023		
2024		
2025		
2026		
2027		
2028		
2029		
2030		

3.3. Fuel costs

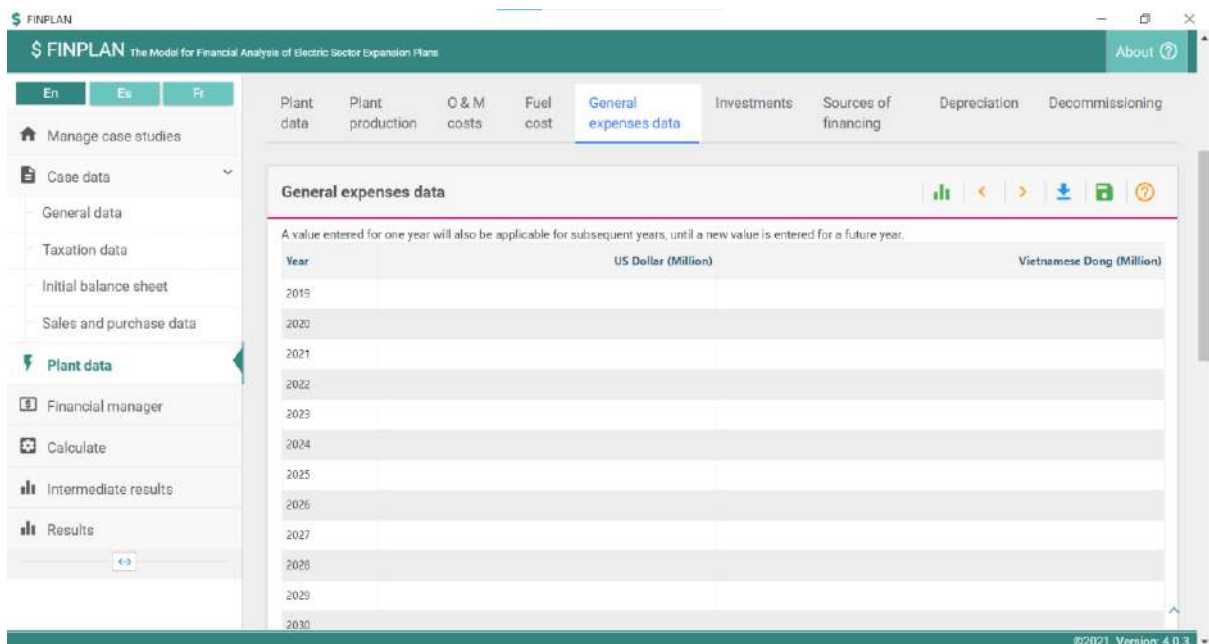
This page allows you to enter the related yearly costs in all currencies defined under “Case data – General data”.

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3.4. General expenses data

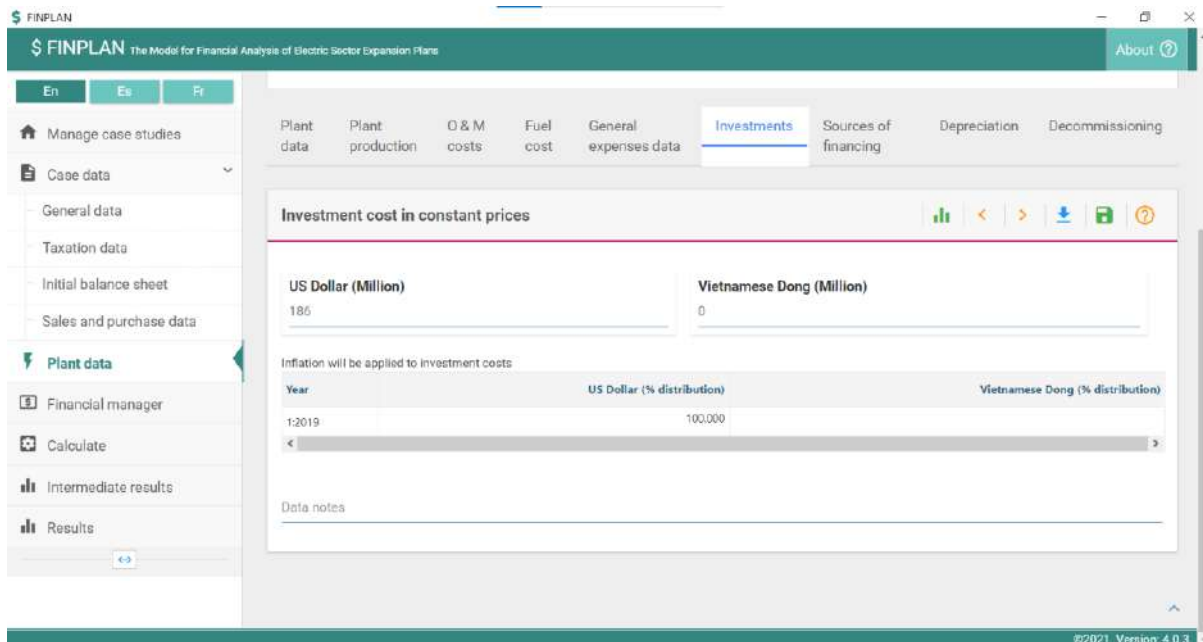
This page allows you to enter any other yearly costs in all currencies defined under “Case data – General data”.



3.5. Investments

In this page, investment costs in the different currencies (as specified under “Case data – General data”) are defined in constant prices, i.e., in real terms. This means the investment costs are entered as if the project would happen today. FINPLAN applies inflation to the investment costs entered by the user to calculate the current (nominal) investment costs in those years the investment occurs. For each currency, the user needs to define the percentage distribution of the investments over the construction period (i.e., vertically, over the years, need to add up to 100%).

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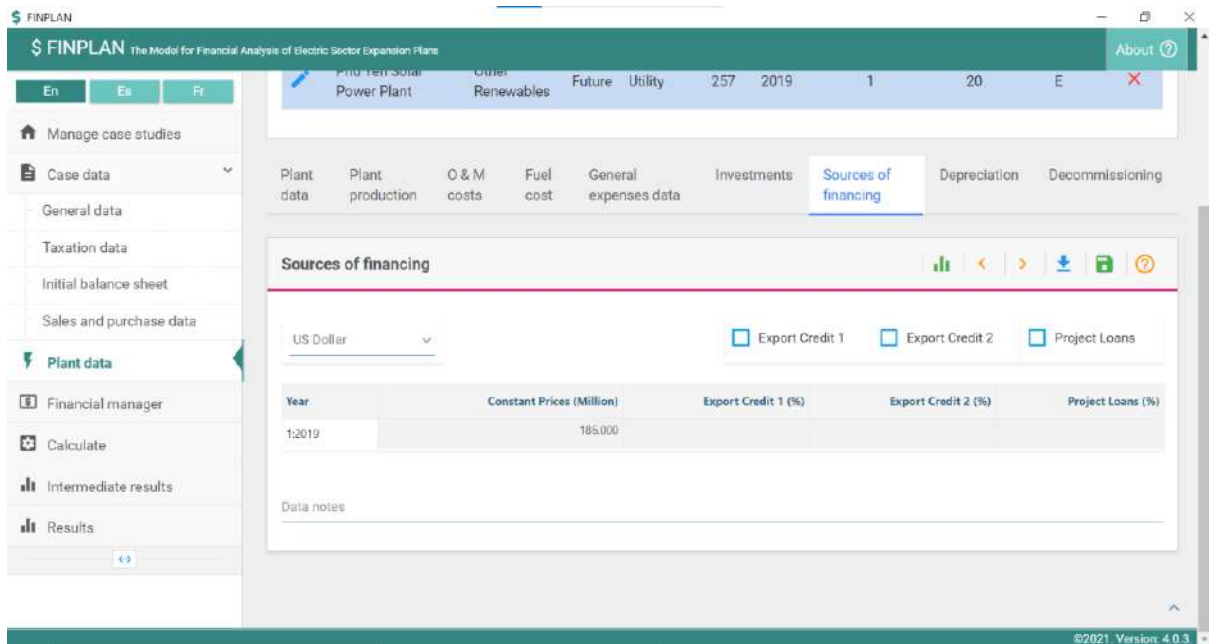


3.6. Sources of financing

In this section, you can define the sources of financing for each currency that are directly related to the project, such as up to two export credits and a project loan. The horizontal sum across all sources of financing for one year cannot exceed 100%, however, can stay well below 100%. Project loans are special loans provided by some (development) banks for projects that fulfil certain conditions. FINPLAN treats them equally as commercial loans entered under “Financial Manager”. Note that it is not possible to select an export credit for the local currency, as the export occurs in a foreign country (in cases where the local currency and the foreign currency are identical, it is recommended to select “Local Currency” as the local currency under “Case data–General data”, and then select the actual foreign currency. This would then require setting the exchange rates to 1:1 under Case data – General data).

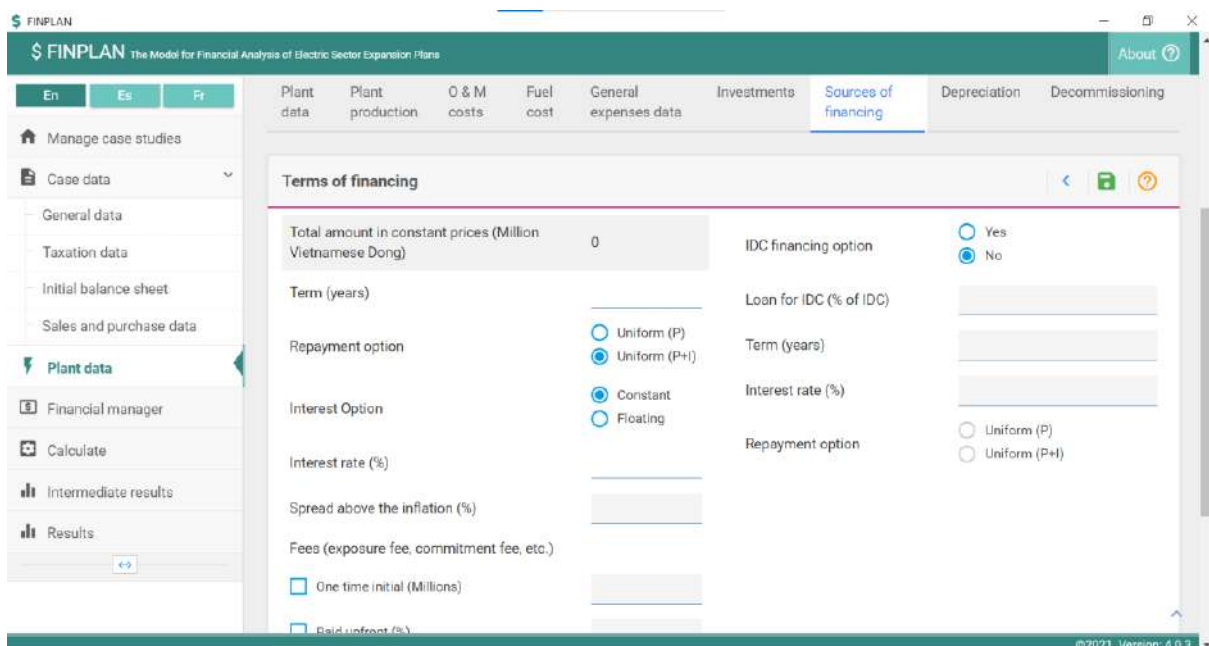
On this page, you can also click on the “Terms of financing” buttons under “Export Credit 1”, “Export Credit 2”, and “Project Loans”, if these parameters have been selected.

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Terms of financing - Export Credit 1 & 2

This page allows you to enter the conditions of the export credits. The interest rate can either be defined as constant over the term or floating above inflation. The repayments can be uniform in that the principal and the interest are constant. Alternatively, the user can select to repay the principal in constant amounts and the inflation is added on top of this. This results in higher payments in the initial years. When using an export credit, repayments of the principal start once the plant went into operation. Interest payments are however due immediately after the first year of the export credit. Please do not use the option to enter fees or IDC (i.e., interest during construction) options, as this functionality of FINPLAN does not work as of now (e.g., it will create an unbalanced Balance Sheet).



Terms of financing – Project Loans

This page allows you to enter the conditions of the project loans. The interest rate can either be defined as constant over the term (in years) or floating above inflation. FINPLAN treats a project loan exactly like separate commercial loans for each year of the construction period i.e., both interest and principal repayments start immediately after the year the loan was drawn. Please do not use the option to enter fees, as this functionality of FINPLAN does not work as of now.

The screenshot shows the FINPLAN software interface. The title bar reads '\$ FINPLAN The Model for Financial Analysis of Electric Sector Expansion Plans'. The sidebar on the left contains a tree view with categories: 'Manage case studies', 'Case data' (with sub-items: General data, Taxation data, Initial balance sheet, Sales and purchase data), 'Plant data' (highlighted), 'Financial manager', 'Calculate', 'Intermediate results', and 'Results'. The main window has a tabbed interface with tabs: 'Plant data', 'Plant production', 'O & M costs', 'Fuel cost', 'General expenses data', 'Investments', 'Sources of financing' (active), 'Depreciation', and 'Decommissioning'. The 'Sources of financing' tab displays the 'Terms of financing' form. The form includes the following fields and options:

- Total amount in constant prices (Million Vietnamese Dong): 0
- Term (years): [text input]
- Interest Option: Radio buttons for 'Constant' (selected) and 'Floating'.
- Interest rate (%): [text input]
- Spread above the inflation (%): [text input]
- Fees (exposure fee, commitment fee, etc.): [text input]
- One time initial (Millions): ☐ [text input]
- Paid upfront (%): ☐ [text input]
- Paid as drawdown (%): ☐ [text input]

The bottom status bar shows '©2021. Version: 4.0.3'.

3.7. Depreciation

This page allows the selection of the depreciation methods and the number of years and rates. Depreciation rates are prescribed with internationally recognized accounting standards and accountants, auditors, etc. tend to be very strict with their application. There are three main methods for depreciation (straight line (e.g., linear), declining balance, sum of the years' digits). Auditors must keep a close eye on their use.

The screenshot shows the FINPLAN software interface. The top bar is green with the FINPLAN logo and the tagline "The Model for Financial Analysis of Electric Sector Expansion Plans". Below this is a navigation menu with tabs: En, Es, Fr. The left sidebar contains a list of modules: Manage case studies, Case data (General data, Taxation data, Initial balance sheet, Sales and purchase data), Plant data (selected), Financial manager, Calculate, Intermediate results, and Results. The main area is titled "Depreciation" and contains several radio button options: Linear (selected), Sum of the years digits, Declining balance, and Declining switching to linear. Each option has associated input fields for "Number of years" and "Depreciation rate (%)". The bottom status bar indicates "©2021, Version: 4.0.3".

3.8. Decommissioning

In this category, the user can define payments which are set aside during the operation of the plant to pay for its decommissioning. When selecting an internal fund, the money will be set aside within the company throughout the modelling period (i.e., it will not be released, but carried forward as retained earnings in the operating account and the balance sheet). When selecting an external trust, the money will leave the company in the specified years, as visible in the cash inflows and outflows.

The screenshot shows the FINPLAN software interface with the "Decommissioning" tab selected. The left sidebar is the same as in the previous screenshot. The main area is titled "Decommissioning" and contains a text box explaining the difference between external trust and internal fund. Below this are radio button options for "Decommissioning cost": External trust (selected) and Internal fund. There are input fields for "Start year of payment", "Last year of payment", "Total amount US Dollar", and "Total amount Vietnamese Dong". The bottom status bar indicates "©2021, Version: 4.0.3".

4. Financial manager

4.1. Equity

This page allows you to enter the yearly amount of the funds contributed by the project owners (the shareholders). The initial equity shows the value entered under “Case data – Initial balance sheet”. The maximum dividend shows the maximum percentage of the total equity that is paid out as a dividend. To set up a FINPLAN model it is often useful not to limit this amount and to enter a very high value instead, e.g., 999. This will ensure that all profit as calculated in the Operating Account is paid out as dividends.

The screenshot displays the FINPLAN software interface. The title bar reads "FINPLAN The Model for Financial Analysis of Electric Sector Expansion Plans". The main window has a sidebar on the left with a menu including "Manage case studies", "Case data" (expanded), "General data", "Taxation data", "Initial balance sheet", "Sales and purchase data", "Plant data", "Financial manager" (highlighted), "Calculate", "Intermediate results", and "Results". The main area shows the "Equity" tab selected under the heading "Name of the case study: Phu Yen Solar Power Plant Project". Below this, there are input fields for "Vietnamese Dong (Million)", "Maximum dividend (%)" (set to 999), and "Initial equity". A table at the bottom is titled "Values are only considered for the year they are entered in this entry form." and has columns for "Year", "Equity", and "Equity returned". The table rows are for the years 2018, 2019, 2020, and 2021. The status bar at the bottom right indicates "©2021, Version: 4.0.3".

4.2. New commercial loans

This page allows you to enter yearly loans drawn in both local and foreign currencies, including the term and an interest spread that is added to the inflation. Loans are repaid from the year after the loan was drawn in equal yearly instalments, simply by dividing the loan over the term. Interest payments are added in addition to these repayments.

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Name of the case study **Phu Yen Solar Power Plant Project**

Equity **New commercial loans** New bonds Other financial data

New commercial loans

US Dollar (Million)
Interest spread above Inflation (%) 1.5
Term (Year's) 1

Vietnamese Dong (Million)
Interest spread above Inflation (%)
Term (Year's)

Values are only considered for the year they are entered in this entry form.

Year	US Dollar - Drawdown (Million)	Vietnamese Dong - Drawdown (Million)
2018		
2019		
2020	35,000	
2021		
2022		

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4.3. New bonds

This page allows you to enter yearly bonds drawn in both local and foreign currencies, including term and the expected interest rate. A bond is repaid at the end of its term. Yearly interest payments apply. Note that for project finance, it may be difficult to access a bond during the construction, but rather once the project is in operation and is generating positive cash flows.

FINPLAN The Model for Financial Analysis of Electric Sector Expansion Plans

Name of the case study **Phu Yen Solar Power Plant Project**

Equity New commercial loans **New bonds** Other financial data

New bonds

US Dollar (Million)
Expected Rate (%)
Bonds Term (Year's)

Vietnamese Dong (Million)
Expected Rate (%)
Bonds Term (Year's)

Values are only considered for the year they are entered in this entry form.

Year	US Dollar - Issued (Million)	Vietnamese Dong - Issued (Million)
2018		
2019		
2020		
2021		
2022		
2023		

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4.4. Other financial data

On this page, you will see three boxes: (1) Other financial data; (2) Shareholders' return data; and (3) Terms of project finance loan.

Other financial data: This box allows you to enter the spread above the local inflation for the short-term deposits and the standby facility. The short-term deposit is a deposit to park any additional

cash for a short period of time. It has the lowest interest rate and it is recommended to enter a negative rate of -1. If the local inflation was 3%, this would mean that the interest received is $(3\% - 1\%) = 2\%$. Similarly, the standby facility is the last resort for FINPLAN to borrow money if more debt is required to balance Cash Inflows and Outflows. As such, the highest interest rate should be entered for the stand-by facility.

Initial outstanding short loans from before the modelling period can also be entered here, to which the rate of the stand-by facility will be applied. Note that the entered initial loan will be added as a liability to the initial balance sheet. To ensure that the assets equal the equity and liabilities, the same amount needs to be added to the list of assets in the left column at “Case data – Initial balance sheet”. However, the outstanding loan entered is not visible here, as the field is greyed out.

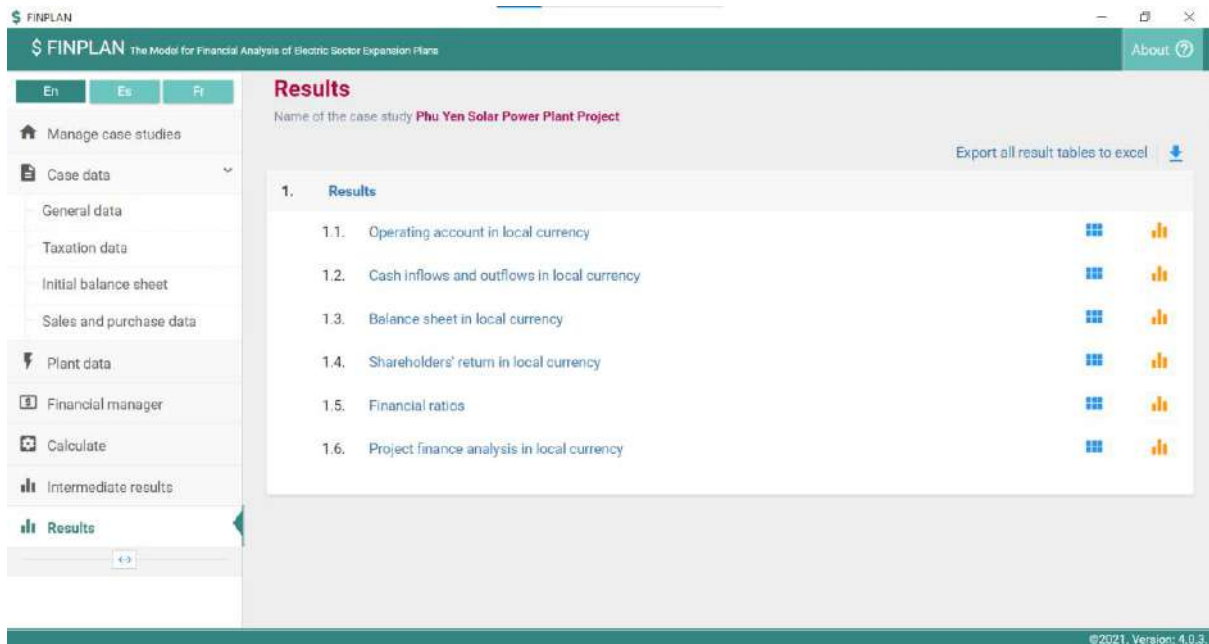
Shareholders’ return data: Entering an approximate average return is only required to initiate the calculations of the Internal Rate of Return (IRR). It is recommended to enter 10, which will then be used as a starting value for the IRR calculations. The disposal year is the year in which it is assumed that the entire project was sold. The discount rate is required for the calculation of the Net Present Value (NPV) from a shareholders’ perspective.

Terms of project finance loan: In this box, the discount rate, the average loan term, and the expected project life can be entered. The discount rate will be used to calculate the present value of the (future) cash available during both, the loan term, and the project life. Further, a security ratio can be entered for both, the loan period, and the project life. This ratio is applied to the present value of the cash available to calculate the maximum project finance in each year, which can then be compared with the loans and bonds outstanding

The screenshot displays the FINPLAN software interface. The top bar shows the title "FINPLAN" and a subtitle "The Model for Financial Analysis of Electric Sector Expansion Plans". The left sidebar contains a navigation menu with options: "En", "Es", "Fr", "Manage case studies", "Case data" (expanded), "General data", "Taxation data", "Initial balance sheet", "Sales and purchase data", "Plant data", "Financial manager" (selected), "Calculate", "Intermediate results", and "Results". The main content area is titled "Other financial data" and shows the case study name "Unbalanced_Case2 - Resolved". Below this, there are tabs for "Equity", "New commercial loans", "New bonds", and "Other financial data" (selected). The "Other financial data" section contains three input fields: "Spread for short term deposits (% above local inflation)" with a value of -1, "Spread for stand-by facility (% above local inflation)" with a value of 4, and "Short loans outstanding initial (Million Local Currency)" with a value of 0. To the right, the "Shareholders' return data" section contains two input fields: "Disposal year" with a value of 2040 and "Discount rate" with a value of 12. At the bottom, the "Terms of project finance loan" section is partially visible, showing a "Discount rate" input field. The bottom status bar indicates "©2021 Version: 4.0.3".

5. Results

On this page, you will see the results that FINPLAN generated. Click on each one of them to view your results in table form or graph form. Note that you can also download the results to your local computer.



5.1. Operating account in local currency

Here, you will see the theoretical account during the financial year – this does not reflect “cash reality”. It is an operating account – it does not include the yearly financing requirements for new investments. This is required to calculate income-dependent cash outflows such as taxes and dividends.

Income

- Includes the same values as in Cash Inflows (and Outflows), but no financing is listed, i.e., it does not include new equity, bond issued, loans drawn, or inflows from the stand-by facility.

Expenditure

- Includes the values in Cash (Inflows and) Outflows, but no repayments of loans, bonds, stand-by facility or equity.
- Instead, the depreciation and foreign exchange losses are listed.
- Foreign Exchange Loss: Investments in foreign currency may cause such foreign exchange losses if the local currency depreciates compared to the foreign currency. Let's assume you borrow 100 USD for 75 EUR. You do not need to pay any interest. When you pay back the money 5 years later, the exchange rate has changed, and 100 USD is now 100 EUR. So, you will have to pay back 25 EUR in addition, which is the foreign exchange loss. Any interest for borrowing the money would have to be added to this. In the Cash Inflows and Outflows table, the foreign exchange loss does not need to be listed, as real cash payments are considered for every year, i.e., the 100 EUR you have to pay back would be listed.
- Depreciation Expenses: Calculated based on the sum of the total investments (see also Balance Sheet –Gross Fixed Assets).
 - Linear depreciation: asset value is depreciated as a straight line over the depreciation period, i.e., the total investments are simply divided by the number of years to calculate the yearly depreciation.

- Declining balance: asset value is depreciated with a constant percentage.
- Declining switching to linear: a mix of declining balance and linear depreciation. The switch to linear occurs when the linear depreciation in a year is larger than what is calculated with declining balance depreciation.
- Sum-of-the-years' digits: asset value depreciated by (remaining lifetime) / (sum of each year of lifetime), e.g., over 3 years: 3/6 depreciation factor in first year, 2/6 second & 1/6 in third.

Profit/Loss, Dividends & Retained Earnings

- A profit & loss in the operating account is a theoretical profit & loss, which has no direct representation in the Cash Inflow and Outflow statement. There could be years where a profit is reported in the Operating Account, yet money is drawn from the stand-by facility in the Cash Inflows and Outflows table. In this case, it might be worth revisiting the chosen depreciation method.
- Dividends are then calculated based on the profit minus any retained earnings. Retained earnings are the accumulated net income that is kept within the company. If retained earnings are negative, they may also be called retained or accumulated losses.
- Note that since dividends are calculated based on the Operating Account, they may be paid despite money having to be drawn from the stand-by facility.
- Note that FINPLAN does not show the accumulated amounts, but the yearly amounts.
- In FINPLAN, earnings will be retained for two reasons:
 - Previous losses (shown as negative values) have not yet been covered by any profits in subsequent years
 - The profit is higher than the maximum amount of dividends that are being paid, based on the maximum dividend ratio entered under "Financial manager – Equity". The maximum amount of dividends to be paid is then calculated by multiplying this ratio by the total equity given in the Balance Sheet.

5.2. Cash inflows and outflows in local currency

Here, you will see Cash Available in Short Term Deposits. The value of the very first year is as entered in "Case Data – Initial Balance Sheet". Sums up the flow from and to the Short-Term Deposits as listed in the Cash Inflow and Outflow table.

Inflows

- **Revenues:** from electricity sales (& other incomes)
- **Interest Earned:** from short term deposit
- **New Equity:** as defined in input data
- **Bonds Issue:** converted to local currency (based on current year's exchange ratio)
- **Loans Drawdowns:** export credits and commercial loans, converted to local currency (based on current year's exchange ratio), the loans are not inflated (i.e., as entered by the user)
- **Stand-by Facility:** money that is missing in a year and thus needs to be made available (usually by an expensive short-term credit). **Long-term financing should be structured to minimise this amount, which should only be drawn on to finance short-term expenditures!**

Outflows

- **Investment:** inflated local and foreign investments (converted to local currency)
- **O&M +Decommissioning Cost / Fuel Expenses:** inflated costs
- **General Expenses:** as entered under Plant Operation Data, but inflated
- **Interest Paid:** all interest to be paid, e.g., for export credit, loan, bonds, or stand-by facility
- **Repayments:** Loans & Bonds and Stand-by facility: all repayments without interest, e.g., the principal repayment for the export credit
- **Equity Repayment:** as entered in Financial Manager under equity. No inflation is applied.
- **Taxes & Royalties:** Income Tax + Royalties
 - **Income Tax:**
 - If tax losses cannot be carried forward (as entered in Case Data - Taxation Data):
 - Tax rate * Taxable Income
 - If tax losses can be carried forward, the taxable income equals the income for the the year plus any losses brought forward. This is calculated as the smaller of the following two:
 - Tax rate * Taxable Income
 - Tax rate * Cumulative Taxable Income, i.e., the sum of all Taxable Incomes up to this year
 - **Taxable Income:** From Results – Operating Account: Total Income–all expenses listed except Income Tax. If income tax = 0 it equals the Profit
 - **Royalties:** Using inputs from Case Data – Taxation Data (in bold) and from Results – Operating Account. Calculated as: Royalty Rate x (Total Income–% of Cost x operational costs in cash (i.e., General Expenses + Expenditure on Purchases + Fuel Costs + O&M Costs + Contribution To external Decommissioning Trust Fund [yet not including any internal decommissioning reserve])
- **Dividend:**
 - Only paid if there is a Taxable Income
 - The maximum amount paid is the equity from the previous year times the dividend rate as entered in Financial Manager under Equity
 - Calculated as the Taxable Income – Income Tax + any negative Retained Earnings of the previous year, e.g., negative Taxable Incomes of previous years.
 - Any negative Retained Earnings of previous years are calculated as:
 - Sum until current year of (Taxable Income – Income Tax –Dividends)
- **Flow to short term deposit:** money that is left over at the end of the year (and usually set aside with low interest). **Financing should be structured to minimise this amount!**

Cash Available

When selecting a VAT on Investment in the Tax Information provided under Case Data. This payment is not listed as an outflow, as it is retrieved once the plant goes into operation. Instead, FINPLAN makes sure the inflows are higher than the outflows and lists the difference as Cash Available, which is used to pay the VAT during construction. In the first year of operation, the summed up VAT paid is retrieved, which is again not listed as an inflow, but as a negative amount in the line Cash Available (VAT). To balance this cash flow statement, every year Total Inflows equal the Total Outflows plus the Cash Available (VAT).

5.3. Balance sheet in local currency

Here, the balance sheet summarises the company's assets, liabilities, and shareholders' equity at a specific point in time. As opposed to the previous results table, it does not show the values for each year, but the accumulative amounts. All items are calculated on the accrual basis of accounting. This sheet is also of interest if someone would wish to buy the company.

Assets

- **Gross Fixed Assets:** accumulated total inflated investments after construction period
- **Net Fixed Assets** are calculated as the Gross Fixed Assets – Accumulated Depreciation – the Balance of the Consumer Contribution
- **Work In Progress:** accumulated total inflated investments during construction. Practically speaking, this refers to an asset under construction that has not yet been commissioned. Therefore it has not yet started its commercial operation and is not yet being amortised or depreciated.
- **Receivables:** accumulated VAT paid on investments (VAT to recover)

Equity and Liabilities

- **Equity:** accumulated equity
- **Retained Earnings:** Taxable Income (i.e., Total Income – all expenses of Operating Account except income Tax) – Income Tax – Dividends
- **Bonds and Net Loans Outstanding:** the principal that needs to be paid in the future, i.e., excluding interest.
- **Consumer Deposits + Decommissioning:** consumer deposits, if any, and funds set aside within the company to pay for decommissioning
- **Current Maturity:** Repayments of loans and bonds due next year + ending balance of the stand-by facility

5.4. Shareholders' return in local currency

Here, equity and dividends are assessed, not the overall project. IRR and NPV are calculated based on the "Total Flow", i.e., purely from a shareholder's perspective, not an overall project perspective, which would consider all yearly costs and benefits. Final Disposal assumes the entire project was sold in the disposal years entered in the Financial Manager, i.e., equity is being paid out. Return on Equity is the yearly ratio of dividends to equity, as given in the Balance Sheet

5.5. Financial ratios

Here, you will see a list of indicators. However, the recommended indicators are the Exchange risk, Breakeven point, Debt equity ratio, and Debt service coverage.

Leverage

- The ratio of debt to equity in a given year – refer to balance sheet:
 - Generally speaking, the higher the value the worse the financial condition of the project, as it depends more on debt and has a higher danger of bankruptcy. However, what leverage is acceptable strongly depends on whether a project is

assessed on a standalone basis, or as one out of many projects being summarised in the balance sheet of a company.

- $(\text{Bonds and net loans outstanding}) / (\text{equity} + \text{retained earnings})$
- $0 \leq \text{Leverage} \leq 15$
- Warning if larger than 1.3

Exchange risk

- Local Cash vs. foreign expenditures:
- Identifies the risk for foreign financiers.
- $\text{Local Cash} / (\text{foreign loan and bonds repayments, interest charges and operating costs} [\text{minus any swap flow in foreign currency}])$
- $\text{Local Cash} = \text{Revenues (refer to Cash Inflows and Outflows) plus local bonds and loans issued minus all local expenditures (incl. income tax, excluding dividends, retained earnings, and excluding earned interest)}$
- $0.1 \leq \text{Exchange Risk} \leq 15$
- Warning if smaller than 1.2, i.e., a security margin of 20%.

Breakeven point

- Break-even analysis is used to determine the point at which revenue received equals the costs associated with receiving the revenue. Break-even analysis calculates what is known as a margin of safety, the amount that revenues exceed the break-even point. This is the amount that revenues can fall while still staying above the break-even point.
- $\text{Fixed Costs} / (\text{Sales} - \text{Variable Costs associated with Electricity Sales})$
- A value of 1 means that costs can be covered. A value of 0.5 means that even if the plant would only generate 50% of the revenues (sales minus fuel costs), it would still cover its costs.
 - $(\text{Operational Costs in Cash} - \text{Fuel Costs} - \text{Purchases} + \text{Repayments: Loans and Bonds} + \text{Interest/Swap to be paid} - \text{Interest due}) / (\text{Sales} - \text{Expenditure on Purchases} - \text{Fuel Expenses})$
 - $\text{Operational Costs in Cash} = \text{General Expenses} + \text{Expenditure on Purchases} + \text{Fuel Costs} + \text{O\&M Costs} + \text{Contribution To external Decommissioning Trust Fund (yet not including any internal decommissioning reserve)}$
 - $0.1 \leq \text{Break Even Point} \leq 10$
 - Warning if larger than 0.8

Debt equity ratio

- The share of debt to debt plus equity – refer to balance sheet and explanations to the indicator “Leverage”:
 - $(\text{Bonds and net loans outstanding}) / (\text{equity} + \text{retained earnings} + \text{Bonds and net loans outstanding})$
 - Warning if larger than 0.6

Debt service coverage

- Cash available / debt services – refer to Intermediate Results – Sources & Application of Funds:

- Enough cash should be on the account to repay all debt (principal and interest).
- $(\text{Pre Investment Cash} + \text{New Equity}) / (\text{Total Interest Paid} + \text{Total Repayment})$
- Warning if smaller than 1.3, i.e., a 30% security margin.
- The higher the risk, the higher the DSCR should be. In regulated business around 1.4–1.45, otherwise (with offtake agreement) 1.5–1.8, in less risky region maybe 1.2–1.4.

Other indicators less important for FINPLAN trainings are listed below:

Working Capital Ratio

- Not frequently used during FINPLAN trainings
- Liquidity ratio is commonly defined as the relative proportion of an entity's current assets to its current liabilities.
- It is intended to show the ability of a business to pay for its current liabilities with its current assets. When current assets exceed current liabilities, the firm has enough capital to run its day-to-day operations. In other words, it has enough capital to work.
- Important to creditors because it shows the liquidity of the company. A value of one is considered as ok, neither good nor bad.
- Calculation in FINPLAN is assets to liabilities, i.e., not current (= this year's) assets to current liabilities – refer to balance sheet:
 - $(\text{net fixed assets} + \text{work in progress}) / (\text{equity} + \text{retained earnings} + \text{bonds and net loans outstanding})$
 - $0 \leq \text{WCR} \leq 4$
 - Warning if ≤ 1

Equipment Renewal

- Not frequently used during FINPLAN trainings
- Indication of when most of the costs are depreciated and investment may need renewal. Refer to balance sheet:
 - $(\text{Net Fixed Assets} + \text{Work In Progress}) / (\text{Gross Fixed Assets} + \text{Work In Progress})$
 - Warning if smaller than 0.5

Gross Profit Rate

- Gross profit / net sales (does not consider investment costs or debt repayments). States how much the net sales can be reduced without incurring any loss:
 - $(\text{Sales} - \text{Operational Costs in Cash}) / (\text{Sales} - \text{Variable Costs associated with Electricity Sales})$
 - $(\text{Sales} - \text{Operational Costs in Cash}) / (\text{Sales} - \text{Expenditure on Purchases} - \text{Fuel Expenses})$
 - $\text{Operational Costs in Cash} = \text{General Expenses} + \text{Expenditure on Purchases} + \text{Fuel Expenses} + \text{O\&M Costs} + \text{Contribution To external Decommissioning Trust Fund (yet not including any internal decommissioning reserve)}$
 - $0 \leq \text{Gross Profit Rate} \leq 1$
 - Warning if smaller than 0.2

Debt Repayment Time

- The time to repay current debt assuming this year's revenues would remain constant – refer to Balance Sheet and Cash Inflows and Outflows
 - $(\text{Bonds and net loans outstanding}) / (\text{Total Revenues} - \text{Operational Costs in Cash} - \text{Royalties} - \text{Income Tax})$ (yet not including any internal decommissioning reserve)
 - $0.2 \leq \text{Debt Repayment Time} \leq 40$
 - Warning if larger than 4

Interest Charge Weight

- Not frequently used during FINPLAN trainings
- Interest as a share of $(\text{Sales} - \text{Variable Costs associated with Electricity Sales})$ –refer to Cash Inflows and Outflows
- $(\text{Interest Paid} - \text{Interest Earned}) / (\text{Sales} - \text{Expenditure on Purchases} - \text{Fuel Expenses})$
- $0.01 \leq \text{Interest Charge Rate} \leq 2$
- Warning if larger than 0.2

Global Index

- Not used during FINPLAN trainings
- $\text{Weight} \times \text{"Warning Value"} \times \text{Break Even Point Value} + \text{the same for Interest Charge Rate}$
- $0.1 \times 0.8 / \text{Breakeven Point} + 0.05 \times 0.2 / \text{Interest Charge Rate}$

Self-Financing Ratio

- Not frequently used during FINPLAN trainings
- Indicates the ability to finance planned investments from the company's own resources – refer to Intermediate Results – Sources & Application of Funds:
 - $(\text{Pre-Investment Cash} + \text{Net Increase in Consumer Contributions} + \text{Consumer Deposits} - \text{Total Interest Paid} - \text{Total Repayment (of Loans and Bonds)} - \text{VAT to Recover}) / (\text{the average of this and next year's Global Investment})$
 - $\text{Pre-Investment Cash} = \text{Sales} - \text{Operational Costs in Cash} - \text{Royalties} - \text{Income Tax}$
 - Warning if smaller than 0.3

ROR on Rev Assets

- $\text{Net Income} / \text{Total Assets}$ – refer to Balance Sheet:
 - $(\text{Total Income} - \text{Interest Earned} - (\text{Total Expenses} - \text{Interest Paid})) / (\text{the average of this and next year's Net fixed assets} + \text{Work in Progress}) \times 100$
 - This equals: $(\text{Taxable Income} + \text{Interest Paid} - \text{Interest Earned} - \text{Income Tax}) / (\text{the average of this and next year's Net fixed assets} + \text{Work in Progress}) \times 100$
 - Warning if smaller than 8

5.6. Project finance analysis in local currency

Here, you can analyse if there is enough cash available to service the debt when taking the security ratio into account. For this analysis, the present value of cash available in the future is considered. The analysis is performed both over the loan term and the project life. The main output is the

maximum project finance, which needs to be compared to the loans and bonds outstanding. Input data for this analysis is entered under Financial Manager – Terms of Project Finance Loan.

- **Loans and Bonds Outstanding:** Bonds Outstanding and Net Loans Outstanding as given on the Balance Sheet
- **Cash available during Loan Term:** Pre-Investment Cash, starting from one year after the first year of debt service until the average loan term has passed (see input data)
 - $\text{Pre-Investment Cash} = \text{Sales-Operational Costs in Cash} - \text{Royalties} - \text{Dividends}$
- **PV of Cash available during Loan Term:** Net present value of all future Cash available during Loan Term, starting from and discounted to the Study Year (given in the column header)
- **Maximum Project Finance during Loan Term:** PV of Cash available during Loan Term divided by Security Ratio for Loan Period
- **Cash available during Project Life:** like Cash available during Loan Term, but until expected life expired, starting from one year after the first year of debt service (see input data)
- **PV of Cash available during Project Life:** Net present value of all future Cash available during Project Life, starting from and discounted to the Study Year (given in the column header)
- **Maximum Project Finance during Project Life:** PV of Cash available during Loan Term divided by Security Ratio for Project Life

5.7. Cash Inflows and Outflows vs. Operating Account vs. Balance Sheet

CFS for Cash Flow Statement (i.e., Cash Inflows and Outflows), OA for Operating Account (i.e. Income Statement or Profit & Loss Statement), BS for Balance Sheet

In the OA all financial transactions are logged which are made by a corporation (be they + or -) during a financial year (FY). However, companies can raise (or receive) invoices and be paid (or pay), say three months later. While the business flows are registered in the OA upon the issuing of bills or the receipts of invoices (i.e., the accrual basis of accounting), the flows of cash subsequently spent or received in connection with such bills or invoices can be delayed. These actual cash flows are registered in the CFS. This is referred to as the cash basis of accounting.

The difference between those two flows (i.e., business and cash) is due to the effect of time elapsing. One could also say somehow that the OA is virtual to some extent, while the CFS is more fact - (i.e., cash-) based. However, both are eventually reconciled with the spanning of time, and the Balance Sheet ("BS") gives a snapshot of the financial situation of a corporation on a precise date.

Another key reason for the difference between the OA and the CFS is the accounting of the depreciation and amortization charges in the OA, while the CFS accounts for the investments and the debt repayment schedule. In most cases, the assets depreciation schedule has a different profile compared to the one for the repayment of a (long-term) debt. This is because a building (for example) will typically be depreciated over, say 30 years. This is the time limit, also called economic life, beyond which the building would arguably need to be refurbished before one could continue using it. However, a loan taken to partly finance its construction will be repaid during, say 20 years. Therefore, the 10-year difference in the profile "mechanically" introduces a difference in the flows. (Similarly, one might borrow money over 5 years to buy a car, which could be depreciated over, say 10 years.).

Depreciation rates are more or less prescribed with internationally recognized accounting standards (IFRS, USGAAP, etc.) and accountants, auditors, etc. tend to be very strict with their application. There are three main methods for depreciation (straight line (e.g. linear), declining balance, sum of

the year' digits). Auditors keep a close eye on their use (in particular, one cannot change the methodology every year in order to "massage" the numbers).

Based on the above, the profit before tax calculated in the OA is the basis upon which the amount of corporate tax and subsequently the dividends are computed. Another key difference between the OA and CFS comes from taking into account the working capital and its variations in the CFS (e.g., the variations between acc. payables and less acc. receivable).

Due to the differences in CFS and OA, there is often a difference between (a) the net result, i.e., the profit/loss as calculated in the OA, and the net cash-flow as calculated in the CFS. The net cash-flow equals the flows from the stand-by facility if money needs to be borrowed due to a loss or flows to the short-term deposit if too much cash is available at the end of the year. This money that is available when subtracting all yearly cashout flows from inflows is as well referred to as working capital. It can only be seen in the CFS and is an important indicator of the financial viability of the project or company.

Note that as dividend are calculated based on the OA, they may be paid despite money having to be drawn from the stand-by facility in the CFS.

6. Annex – Export Credit

This annex explains how to model an export credit in the absence of already agreed terms and conditions. An export credit is directly linked to an export contract, e.g., for a technology, and can only be used to finance expenditures within this contract. The key defining aspects of the export credit are its term (i.e., the repayment period) and the interest rate applicable to the principal. The principal is the total amount financed by debt through the export credit. It may thus include interest during construction (i.e., the draw-down period), if this interest is debt financed and capitalised.

The terms and interest rate are defined by the OECD "Arrangement" and its export credit sector understandings¹. However, the Arrangement is a gentlemen's agreement between Australia, Canada, the European Union, Japan, Korea (Republic of), New Zealand, Norway, Switzerland, and the United States. As such, it is not binding and does not include important players such as Russia and China. Nevertheless, it serves as a very useful starting point to look for the terms and interest rates for an export credit.

Export Credit Agencies (ECAs) include European ECAs, the US EXIM, the Canadian EDC, the Japanese JBIC and NEXI, the Russian EXIAR, or the South Korean KSURE. An ECA basically provides three products: (1) direct loans, (2) guarantees and /or (3) insurances.

Under a direct loan with an ECA, the ECA is providing a credit facility to the borrower, which is characterised by the principal and its term. For a guarantee or an insurance, three parties are commonly involved: (1) the borrower itself, (2) a financial institution (e.g., the lender) lending money at preferential rates (e.g., the commercial interest rate of reference (CIRR) defined on the OECD Export Credit website) and (3) the ECA that provides the guarantee or insurance to the lending institution. Sometimes, the ECA acts as well as the lending institution and thus combines these two functions.

¹ www.oecd.org/tad/xcred

The main difference between a guarantee and insurance is that with a guarantee the lender knows that the ECA will repay them in case of default, whatever the reasons for such a default (i.e., in any case the borrower fails to fulfil its commitments. As such, a guarantee can be considered as signing a blank check.

The insurance on the other hand usually has a set of conditions that need to be fulfilled for it to be paid. It is therefore not paid in instances where the ECA can demonstrate that certain clauses of the insurance policy were not complied with. As such, it is very similar to, e.g., a home insurance. An insurance usually does not cover 100% of the export contract. This is to ensure that the lending institution has an incentive to support the borrower in his efforts to meet his obligations, but the same set-up could also be used for a guarantee.

6.1. Premium or Exposure Fee

For both guarantee and insurance, a premium or exposure fee must be paid. This is a compensation for the financial risk undertaken when providing coverage to an export credit. It covers the overall export credit period, e.g., up to 18 years for a new nuclear power plant. The premium is due as a condition precedent to the drawdown of the export credit. It may be charged in its entirety upfront at the start of the insurance period, or alternatively it may be charged during the drawdown period, i.e., during the construction period. This alternative is slightly more expensive to reflect the time-value of money (i.e., as the export credit agency receives the total premium at a later stage). A lower coverage on the other hand (i.e., if a lower percentage of the export contract is covered, which is very common for an insurance as mentioned before) reduces the premium which has to be paid by the borrower for the guarantee or insurance. This is because a lower coverage reduces the financial risk involved for the ECA.

The premium is usually calculated based on a risk assessment of the borrower (see, e.g., OECD country risk assessment on its Export Credit website) and the total amount of coverage provided by the export credit agency. This total amount comprises the principal and may as well include the estimated number of interests ("i") during the construction and repayment period (i.e., the sum of the yearly i), in case the ECA has agreed to cover the interest as well.

The amount of the premium due can be borrowed and repaid once the plant goes into operation if the borrower does not have the cash to pay for it. In this case, the rate to calculate the premium increases². This is a compensation to cover the higher risk of a financed premium, as opposed to a premium that is paid in cash upfront or during construction. The amount of this premium is then added to the total amount of the principal covered by the export credit. As the principal is increased by this premium, obviously also an interest needs to be paid as the ECA is basically granting a loan to the insured party.

In the balance sheets of a company, the premium is usually added to the gross value of the assets which is covered by the export credit. The gross value of the assets would therefore comprise the complete costs of the project, including the costs of goods & services, owner & development costs, any interest capitalised during construction and the premium.

The homepages of export credit agencies are a good source of more detailed information.

² If the premium is borrowed, its calculation may require some circular iterations, as the premium is calculated as a share of the principal to which it is then added, thus increasing the principal and thus requiring a new calculation of the premium, which is then added to the principal again, etc.

6.2. Escalation of Investment Costs During Construction

Note that in FINPLAN, the investments increase with inflation, yet the export credit is frozen to the original investment cost entered (i.e., the costs agreed on at the “time of signature”). As such, even if 100% was financed through an export credit, at the end of the construction period there will be a shortfall in overall available long-term debt (i.e., export credit) due to the escalation of the actual investment costs. Other sources of financing such as the short-term facility would have to cover the remainder. In reality, it could be contractually agreed that the contract price escalation as envisaged in the contractual arrangements will be considered by the export credit by:

- (a) making an estimate of the total amount to be financed with debt, including any price escalation during the construction period.
- (b) increasing the amount of export financing required accordingly upfront. The insurance provided by the export credit agency will then be based on the escalated price of the contract.
- (c) including a price escalation mechanism for automatic adjustments, e.g., based on inflation.
- (d) fine-tuning the total amount of debt to be repaid at the end of the construction period.