



FINPLAN

Hands-on 6: Setting up a case for a single combined cycle power plant

Useful links:

- 1) [Download the software](#)
- 2) [Export Credit Agency fees](#)
- 3) www.exim.gov
- 4) www.oecd.org/trade/xcred/eca.htm
- 5) investopedia.com
- 6) [Results from this Hands-on](#)

Learning outcomes

This exercise will help you obtain some hands-on experience on how to use the FINPLAN interface by creating a complete case study to analyse the financial viability and financial structure of power projects.

In this section, you will learn how to set up a FINPLAN case and assess the financial viability of a power project. The financial viability of a single combined cycle power plant will be examined in this exercise.

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

1. Set up a new case study in FINPLAN and create a backup
2. Carry out a simple test run in FINPLAN
3. Check the data entered with Intermediate results
4. Create a Cash Flow Statement
5. Check the Operating Account
6. Check the Balance Sheet
7. Calculate Financial Ratios
8. Estimate Shareholder Return



Activity 1

Set up a new case study in FINPLAN and create a backup

a. Background

A utility would like to assess the financial viability of a single combined cycle power plant from 2015–2040, financed with a mix of equity and debt instruments in both local currency and US Dollars. After a construction time of 3 years, the 300 MW plant will generate 2,000 GWh from imported gas from 2020 onwards until the end of its lifetime in 30 years. The plant will cost 300 million USD, with expenditures distributed 25%, 50%, and 25% over the construction time. A debt-to-equity rate of around 70:30 is envisaged. The plant is depreciated linearly over 20 years. Electricity can currently (2015) be sold at 0.24 local currency units (LC) per kWh, increasing with inflation. O&M costs are expected to amount to 29.44 million LC. Gas import costs amount to 109 million USD.

b. Economic data

- Inflation USD: 1%
- Inflation Local Currency: 5%
- Exchange rate: 3 units of local currency per USD for 2014, 3.2 for 2015; exchange rate reflects inflation rates
- Income tax: 20%, losses to be carried forward, no losses in start year.

c. Financial data

- Initial Balance Sheet: 80 million as short-term deposits; 80 million equity
- Sources of financing - USD: 60% export credit over 12 years with uniform principal and interest repayment at an interest rate of 5.5%.
- Equity: 80 initially, 100 million LC in 2017 and 130 million in 2019. No limit to dividends being paid out.
- New Commercial Loans: 60 mill. USD in 2018, 10 mill. in 2019, over 8 years, interest: 3% over inflation
- Bonds: 10 million USD in 2018 over 5 years. Expected rate: 5%
- Short-term deposits: interest rate -1% over inflation

- Stand-by facility: interest rate 4% over inflation. The stand-by facility is the most expensive financial instrument available in FINPLAN and is used to cover any financial shortfalls in a given year and with an annual turnover (i.e., it is expected to be paid back at the end of the year).
- Shareholders' targeted return data: 10% approx. average return, disposal year 2040 (in which the assets are assumed to be sold), discount rate: 6%
- Terms of project finance loan: 6% discount rate (to calculate the net present value of the cash available in the future), 12-year average loan term, 1.4 security ratio for loan period, 30-year expected life, 1.6 security ratio for project life, 2020 first year of debt service

Try It: General hints when setting up a FINPLAN Case

1. Check flows from stand-by facility and to short-term deposits. During construction these should be close to zero, due to high interest of the stand-by facility and the low interest of the short-term deposit. Adjust funding sources if necessary, e.g., increase or decrease the required equity to ensure the flows are close to zero during construction.
2. If the short-term facility is still being used after the power plant went into operation, this is a sign that running costs cannot be covered. This is also shown by the debt service coverage ratio (< 1) and by the breakeven point (> 1) during the years from 2020 onwards. This means that either the sales are too low or the financing costs too high. The costs of financing can be reduced by increasing the equity and decreasing the debt. The sales can be increased by increasing the price for which the electricity is being sold, in case this is an option.
3. (Check the fees of an Export Credit Agency (ECA), such as the US EXIM bank's long-term exposure fee calculator, available at www.exim.gov. Alternative ECAs are available at www.oecd.org/trade/xcred/eca.htm and include, e.g., the German EXIM Bank Hermes, which provides a calculator in German on agaportal.de, or the French EXIM bank COFACE at www.coface.fr)

Activity 2

Simple Exercise – Creating a balanced case

- **2017:** Cash is available in the short-term deposit in 2017, yet further equity is injected, which is not required. The equity is thus reduced to 30 million LC in 2017 and results are recalculated.



- **2018:** The debt–equity ratio of ~0.9 in 2018 may not be acceptable to a lender. Further, the capital markets may only be accessible once the plant has been in operation. Therefore, the 10 million USD bond issued in 2018 is removed. Further, the commercial loan in 2018 is reduced to 30 million USD. The missing amount for 2018 is replaced with 140 million LC of equity. This also improves the debt–equity ratio during construction.
- When looking at the results now, our ratios have improved, and we are able to cover our operating costs from the start of the project. Our debt service coverage ratio is still quite low, which we accept for the time being. We assume that this is not our only project and that we have cash reserves available within our company. In reality, we would of course have to demonstrate to the financiers that this cash is available and reserved for this project. (Alternatively, we could increase the equity or debt further to have extra cash available, but this would just end up with the short-term deposit at a low interest rate. Further, we could of course ask for a higher electricity price).

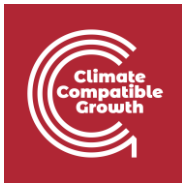
Activity 3

Simple Exercise – Training Tasks

Try It: For the following questions, please open the balanced simple case which you received as a backup by opening FINPLAN and clicking on Restore Case Study and selecting the backup file. Then, look at the various results. It will be easier if you manage to export them to Excel and if you print out the Operating Account, the Cash Inflows and Outflows, and the Balance Sheet.

You can do so by clicking on these results and on the small Excel symbol immediately above the title of the results table. Alternatively, you can click on *Results – Download Spreadsheet* (Note that in this case the results in the Operating Account table are off by one line, so it might help to reformat the table. This is on our list of future fixes).

1. Before going through the following questions, please take some time to compare (printouts of the) different statements (Operating Account, Cash Inflows and Outflows, Balance Sheet) and see how they are linked. Try to think for what purpose each of them is important. *Answer: Yes, I did it. / No, I did not find the time to do it*



Activity 4

Intermediate results

Sometimes you will look at your Financial Statements and see unexpected results. Often, the intermediate results allow you to check if the data you entered are used by FINPLAN as you expect.

Example: Let's say the sales are zero in the Results – Cash Inflows and Outflows throughout the project period, even though you entered an electricity price. In the intermediate results you could check under Sales what quantity of electricity is being multiplied with which electricity price, and maybe you find out that the quantity was zero (e.g., because of forgetting to press the save & proceed when entering data).

Try It: Please take some time to go through the Intermediate Results and familiarize yourself with what you find there. The following questions can be a starting point:

1. What is the exchange rate in the year 2026?
2. The fuel costs were entered in constant monetary terms without applying inflation. What are the actual fuel costs in USD that FINPLAN applies in the year 2031?
3. What is the electricity price in the year 2028?

Activity 5

Cash Flow Statement

Hint: Check Presentation on Financial Statements in FINPLAN and the Word Document explaining the results.

Try It: Create cash flow statements

1. **As a shareholder, when would I get my first money back once the project is operational?**
2. Ideally you should be able to recalculate the results by hand, at least for a simple case. For example, can you recalculate by hand the first loan drawdown in 2017? Check the



definition of Loans Drawdowns in the Word Document explaining the results, then apply the correct exchange rate. Did you manage to do it?

Activity 6

Operating Account

Hint: Check Presentation on Financial Statements in FINPLAN and the Word Document explaining the results. For more detailed explanations, check the definitions on pages like [investopedia.com](https://www.investopedia.com).

Try It: Check the operating account.

1. In the FINPLAN results, the operating account has a line called "Retained Earnings". What are those?
2. Why is there a foreign exchange loss?
3. In what year does the foreign exchange loss become zero?
4. What is special about the year where the foreign exchange loss become zero? Why is it zero from that year onwards?

Activity 7

Balance Sheet

Try It: Check balance sheet

1. There is a flow to the short-term deposit in some years, but not in others. Where (in which financial statement) would I find the answer to this question?
2. When is the first year without negative retained earnings (i.e., without accumulated loss)? What happens in this year when looking at the Cash Flow Statement?



Activity 8

Financial Ratios

Hint: Check Presentations on FINPLAN and the Word Document explaining the results. For more detailed explanations, check the definitions on pages like Investopedia.com.

Try It: Calculate the following on FINPLAN

1. Many financial ratios are only useful from a certain point in time onwards. The Breakeven Point is one of them. What does it mean?
2. From which year onwards is the Breakeven Point a useful indicator? Why not earlier?
3. **What generation reduction would be acceptable in 2029 in order to still cover all costs?**
4. Mention another indicator that is also useful in the years before the plant goes into operation and explain it in a few words.
5. Explain the Debt Service Coverage (Ratio) DSCR.
6. Lenders said they would not accept a minimum Debt Service Coverage Ratio (DSCR) below 1.35 in any year after the construction. Assuming the term of the Export Credit were negotiable, how many years would it need to be to provide this minimum DSCR? How does this align with the OECD Arrangement? What would be alternatives to increase the DSCR?

Activity 9

Shareholders' Return

To answer some of the following questions, please create a copy of your case study as you will need to change the data we entered.

1. What are the main indicators presented in these results?
2. How is the IRR affected if the loans are increased and equity decreased? To find out about this, try to decrease the equity injection in a given year and increase the export



credit in the same year by the same amount. Note that the equity is in local currency and the export credit is in USD. You would thus need to apply the correct exchange rate. *(Multiple possible): Internal Rate of Return (IRR) is not affected. IRR goes up. IRR goes down. IRR improves from a shareholder's perspective. IRR gets worse from a shareholder's perspective*

- 3. Stakeholders would wish to see a higher Internal Rate of Return (IRR) of just above 15%. What would be the required electricity prices (2 decimal digits) for the first year if the price would escalate at 4%?**

Answers

Activity 4: Intermediate results

1. Answer: 4.3
2. Answer: 91.7 Million USD
3. Answer: 0.5 LC/kW

Activity 5: Cash Flow Statement

1. Answer: 2025 is the first year when dividends get paid to shareholders.
2. Answers: Yes, I did it successfully / No, I did not find the time to do it / No, I tried it but could not come up with the right number -> Comments
3. Answer: It is applied to the initial amount without inflation to calculate the loan drawdown. It is assumed that this amount is contractually fixed and does not increase with inflation. As the investment is inflated, this means that the share of the export credit gets smaller. Thus, more equity is needed, and the share of equity increases.

Activity 6: Operating Account

1. Answer: Retained earnings are earnings that are not paid out as dividends to shareholders. Instead, they are kept in the company. If the retained earnings are negative, it means that the company made a loss.
2. Answer: 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 and for some reason 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 are 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.

3. Answer: In 2032.
4. Answer: It is exactly the year when our longest debt is fully repaid (see Word Document with input data for Simple Exercise). As we do not have a debt in foreign currency any longer, there is also no foreign exchange risk any longer.

Activity 7: Balance Sheet

1. Answer: Cash Flow Statement.
2. Answer: 2025. We chose to have tax losses carried forward. As this is the first year without accumulated loss, it is loss, it is also the first year that dividends get paid to the shareholders.

Activity 8: Financial Ratios

1. Answer: Breakeven analysis calculates what is known as a margin of safety, the amount that revenues exceed the costs associated with receiving the revenues. 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.
2. Answer: 2020. Because earlier the power plant is being built and there are no revenues.
3. Answer: If the Breakeven Point for 2020 is 0.9, this means that the revenues could fall by 10%. Thus, the quantity of electricity sold could be reduced by 10%. (If you would wish to verify this in FINPLAN, do not forget to reduce both the electricity sold and the associated fuel costs. Now check the Breakeven Point again, which should have increased to 1. Also check the Cash Inflows and Outflows for 2020. As this year is now completely balanced, there should be basically no inflow from the stand-by facility and outflow to the short-term deposit.).
4. Answer: For example, the Debt–Equity Ratio is important during the construction phase, as it is a key indicator to evaluate the financing of a project from the point of view of a lender. A lender will use the Debt–Equity Ratio to check if sufficient equity is in the project and if the shareholders are sufficiently committed to the project and will cover some risk with their own money.



5. Answer: It indicates if there is enough cash on the account to repay all debt (principal and interest).
6. Answer: Around 17 years, but it is not in line with the OECD Arrangement. Alternative: less debt and/or higher electricity price.

Activity 9: Shareholder's Return

1. Answer: NPV and IRR.
2. Answer: IRR goes up. IRR improves from a shareholder's perspective.
3. Answer: An electricity price of 0.28 LC/kWh results in an IRR of 14.55%. Note: Initially we entered a local inflation of 5%. If the electricity price should increase with only 4%, we have to enter a standard change in addition to inflation of '-1%' when entering the Sales Data. We then need to change the electricity price manually and recalculate the results.