Online Training Course on Nature-based Infrastructure

Module 5 - Block 1
Introduction to Project Finance Modelling
About this slide deck

This slide deck is part of a training course about nature-based infrastructure (NBI).

In this first block we address the following questions:

- What is project finance modelling?
- What are the main components of project finance models? How to do financial modelling for NBI?
- How to integrate environmental and social externalities in project finance models?
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- How this integration could be done? Demonstrate our approach: SAVi methodology.

Section 4: Financial modelling for nature-based infrastructure
- How to do financial modelling for NBI?
- SAVi assessment example.
Project finance for nature-based infrastructure

An alternative way to finance NBI projects

• Built infrastructure often relies on project finance structures (non-recourse financing).
• Treating nature-based solutions as infrastructure opens up the possibility of using project financing.
• Project finance would be especially appropriate for NBI projects that have sufficient revenue streams to make them a viable investment opportunity.
• Alternatively, project finance could be used for hybrid infrastructure projects where NBI is complementing a revenue generating built infrastructure project.
Section 1
Basics of project finance

The following slides explain what project finance is, including its transacting parties and distinctive features.
Financing infrastructure

The project financing structure involves a number of shareholders, known as 'sponsors'.

A sponsor can choose to finance a new project using two alternatives:

1. The project is financed on-balance sheet (corporate financing).

2. The project is incorporated into a newly created economic entity, the SPV (Special Purpose Vehicle), and financed “off-balance sheet” (project financing).

Source: Project Finance in Theory and Practice by Stefano Gatti
What is project finance?

- Project finance refers to the financing of infrastructure using a non-recourse or limited recourse financial structure.
- The debt and equity used to finance the project are paid back from the revenues (e.g. tolls, user fees) generated by the project.

What is non-recourse finance?

- Non-recourse finance is a type of commercial lending that entitles the lender to repayment only from the profits of the project the loan is funding and not from any other assets of the borrower.
- Such loans are generally secured by collateral.

Source: investopedia.com
Parties in a project finance structure

1. Sponsors: they are typically also the owners
2. Lenders: they provide the debt financing to the project
3. Off-taker(s): they purchase the output of the project (e.g. MWh of energy produced) often having a long-term contract in place.
4. Contractor and equipment supplier: They are the key suppliers of raw material. They also perform crucial functions such as design, build, operations and maintenance.
5. Operator: The are responsible for operating the project.
6. Financial Advisors
7. Technical Advisors
8. Legal Advisors
9. Regulatory Agencies
10. Multilateral Agencies / Export Credit Agencies: They provide development financing to the project often in the form of loans.
11. Insurance Providers
Parties in a project finance structure

- **Sponsors** (Authorized by Shareholders of Parent Company)
- **Financial Institutions/Banks**
- **Host Government**
  - Grants, Subsidies & Licences
- **Special Purpose Vehicle (SPV)**
  - Equity
  - Debt
  - Purchasers of Produce
- **Off Takers**
- **Suppliers**
- **Contractors**

Source: efinancemanagement.com
Types of sponsors in project finance

- **Industrial sponsors**, who see the initiative as upstream or downstream integrated or in some way linked to their core business
- **Public sponsors**, central or local governments, municipalities, or municipalized companies, whose aim is to provide social welfare
- **Contractor/sponsors**, who develop, build, or run plants and are interested in participating in the initiative by providing equity and/or subordinated debt
- **Financial investors**, often private equity investors, whose aim to generate a risk adjusted return.

Source: Project Finance in Theory and Practice by Stefano Gatti
Distinctive features of a project finance transaction

1. **Debtor** (borrower) is a project company (special purpose vehicle) set up on an ad hoc basis that is financially and legally *independent* from the sponsors.

2. **Lenders** have only *limited recourse* (or in some cases no recourse at all) to the sponsors after the project is completed.

3. **Project risks** are allocated equitably between all parties involved in the transaction, with the objective of assigning risks to the contractual counterparties best able to control and manage them.

4. **Cash flows** generated by the SPV must be sufficient to *cover payments* for operating costs and to service the debt in terms of capital repayment and interest. Because the primary use of cash flow is to fund operating costs and to service the debt, only the remaining funds after debt servicing can be used to pay dividends to sponsors.

5. **Collateral** is given by the sponsors to lenders as security for receipts and assets tied up in managing the project.

Source: Project Finance in Theory and Practice by Stefano Gatti
Greenfield vs. brownfield projects

The financing needs and the optimal financing structure are different for greenfield and brownfield projects.

Greenfield project

• It refers to an asset that has some level of development or construction requirement. For example: building a new power plant.

• It has a higher risk than projects that are already operating.

• It often requires a more expensive construction loan before using long term debt financing.

Brownfield project

• It is a developed asset that may still require ongoing capital expenditure and expansion.

• The operating asset is used as a collateral for the additional financing / re-financing used.
Section 2
Use of project finance modeling

The following slides explain the purpose of project finance models and discuss their main components.
Project finance modelling

- Project finance modeling is an excel-based analytical tool used to assess the risk-reward of lending to or investing in a long-term infrastructure project based upon a complex financial structure.

- All financial evaluations of a project depend upon expected future cash flows generated by activities of a completed project and a financial model is built to analyze this.

Source: wallstreetprep.com
What are project finance models used for?

The main purposes of a project finance model are to:

1. Identify the optimal capital structure
2. Assess the financial viability of the project
3. Calculate the expected return on investment under different operational and risk scenarios.

The following slides provide more information on these three points.
What are project finance models used for?

1. Identify the optimal capital structure

- Project sponsors use financial models to determine the **optimal debt-equity split** used in the financing of the project.

- This largely depends on the project’s **revenue and cost profile**: The timing and size of incoming cash flows during operations and the associated costs in each period.
What are project finance models used for?

1. Identify the optimal capital structure

Most infrastructure projects follow a so-called “J-curve”: They have high upfront costs and relatively small but steady revenue streams. The “J” represents a certain number of years before the project breaks even and generates a return on investment.

Source: cnlsecurities.com
What are project finance models used for?

2. Assess the financial viability of the project

- Project finance models can also calculate whether the cash flows generated by the project will be sufficient to service the debt and generate an attractive risk-adjusted return for both equity investors.

- This assessment includes the calculation of key performance indicators, such as the internal rate of return and the net present value.
What are project finance models used for?

3. Calculate the expected return on investment

• Project finance models are also well placed to stress test projects and assess how the expected return changes under certain operational and risk scenarios.

• This can be calculated by a so called “scenario table,” which modifies key project assumptions and shows how key financial indicators react to these changes.
  
  o **Scenarios** could be simple operational events, such as an increase in the price of feedstock, disruption in operation, or more complex climate events, such as heatwaves, sea-level rise, or a carbon tax.
What are project finance models used for?

3. Calculate the expected return on investment - impact of climate change

Climate change can potentially have a material impact on the financial viability of infrastructure projects. Financial models can be used to assess the financial impact of climate scenarios.

Climate change can impact the following data points in an infrastructure project:

- **Construction costs:** Making the project more climate resilient (e.g. withstand floods) can increase the cost of construction and/or make the construction time longer.

- **Operating costs:** The cost of production can increase due to loss of efficiency as a result of higher temperatures for example.

- **Production:** Outages caused by climate events (e.g. violent storms) can negatively impact the number of units produced.

- **Cost of financing:** Financial institutions and investors are increasingly pricing in climate related risks in their interest premiums. This can lead to higher cost of financing for infrastructure that are not climate resilient.
**Key financial indicators**

**Net Present Value (NPV):** The difference between the present value of cash inflows net of financing costs and the present value of cash outflows. It is used to analyze the profitability of a projected investment or project.

**Internal Rate of Return (IRR):** An indicator of the profitability prospects of a potential investment. The IRR is the discount rate that makes the net present value of all cash flows from a particular project equal to zero.

**Payback period (PP):** The term payback period refers to the amount of time it takes to recover the cost of an investment. Simply put, it is the length of time an investment need to reach a breakeven point.

**Sustainable IRR (S-IRR) & Sustainable NPV (S-NPV):** In this case traditional financial indicators of IRR and NPV are modified by integrating environmental, social and economic costs and benefits in the calculations.
Main components of project finance models

The “Input” worksheet includes the main project assumptions / data.

<table>
<thead>
<tr>
<th>Input Name</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development costs</td>
<td>Development costs are also known as capital expenditures. This includes information on when these costs are spent during the construction phase. This could inform decisions on when to tap additional financing.</td>
</tr>
<tr>
<td>Construction time</td>
<td>The construction phase can be expressed in number of quarters or years. The start of construction will also determine the model’s starting date.</td>
</tr>
<tr>
<td>Operational expenditure</td>
<td>Operational expenditure includes the fixed and variable costs of operating the project.</td>
</tr>
<tr>
<td>Operations time</td>
<td>The operations phase is expressed in number of years. Construction and operation phases can overlap if the generation capacity is gradually being increased.</td>
</tr>
<tr>
<td>Production / generation / quantity</td>
<td>This data point represents the quantity produced when calculating the revenue. Depending on the type of infrastructure, it can be the amount of energy generated for a wind farm or the number of cars on a toll road.</td>
</tr>
</tbody>
</table>
Main components of project finance models

The “Input” worksheet includes the main project assumptions / data.

<table>
<thead>
<tr>
<th>Input Name</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit price</strong></td>
<td>This data point represents the price variable when calculating the revenue generated. It can be the expected nominal electricity prices or the toll for a highway. Base, low, and high price levels can be included to make assessing different price scenarios easier.</td>
</tr>
<tr>
<td><strong>Senior debt</strong></td>
<td>This covers all the debt-related financial information, including the size of debt financing used, the interest rate premium on top of the risk-free rate, various financing fees, debt tenor, and the initial time period when interest payments are waived (also called the grace period).</td>
</tr>
<tr>
<td><strong>Equity</strong></td>
<td>Equity-related information includes the amount of initial equity financing and any additional increase needed during construction. In addition, the financial model should be able to take into account the percentage of profits that is paid out as dividends as well as the equity cost of capital.</td>
</tr>
<tr>
<td><strong>Macroeconomic data</strong></td>
<td>Macroeconomic data includes the risk-free interest rate for the currency used in the model. If any currency conversions are required, the relevant exchange rate can also be specified here. Finally, the expected inflation rate is also included here.</td>
</tr>
</tbody>
</table>
Project finance model example - Wind farm

The input worksheet includes most hard coded data points for the financial model.

<table>
<thead>
<tr>
<th>Construction Development Costs</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Turbine Construction GBP M</td>
<td>60.00</td>
<td>100.00%</td>
<td>12.50%</td>
</tr>
<tr>
<td>EPC Management GBP M</td>
<td>6.00</td>
<td>100.00%</td>
<td>12.60%</td>
</tr>
<tr>
<td>Civil Works GBP M</td>
<td>10.00</td>
<td>100.00%</td>
<td>25.00%</td>
</tr>
<tr>
<td>Electrical GBP M</td>
<td>4.00</td>
<td>100.00%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Wind Monitoring GBP M</td>
<td>3.00</td>
<td>100.00%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Spare GBP M</td>
<td>-</td>
<td>0.00%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Spare GBP M</td>
<td>-</td>
<td>0.00%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Total GBP M</td>
<td>82.00</td>
<td>100.00%</td>
<td>12.50%</td>
</tr>
<tr>
<td>Contingency %</td>
<td>10.00%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operations Generation</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Turbines Num #</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Period</td>
<td>Op Yr 1</td>
<td>Op Yr 2</td>
<td>Op Yr 3</td>
</tr>
<tr>
<td>Generation per Turbine MWh p.a.</td>
<td>5.000</td>
<td>5.000</td>
<td>5.000</td>
</tr>
<tr>
<td>Flex</td>
<td>5.000</td>
<td>5.000</td>
<td>5.000</td>
</tr>
<tr>
<td>Applied</td>
<td>5.000</td>
<td>5.000</td>
<td>5.000</td>
</tr>
<tr>
<td>Overall Efficiency %</td>
<td>97.00%</td>
<td>97.00%</td>
<td>97.00%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Revenue Price (Nominal)</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Period</td>
<td>Base</td>
<td>2016</td>
<td>2017</td>
<td>2018</td>
<td>2019</td>
</tr>
<tr>
<td>Base USD/MWh</td>
<td>110.00</td>
<td>115.00</td>
<td>117.00</td>
<td>120.00</td>
<td>123.00</td>
</tr>
<tr>
<td>Low USD/MWh</td>
<td>80.00</td>
<td>85.00</td>
<td>87.00</td>
<td>90.00</td>
<td>93.00</td>
</tr>
<tr>
<td>High USD/MWh</td>
<td>140.00</td>
<td>145.00</td>
<td>147.00</td>
<td>150.00</td>
<td>153.00</td>
</tr>
<tr>
<td>Selected case USD/MWh</td>
<td>110.00</td>
<td>115.00</td>
<td>117.00</td>
<td>120.00</td>
<td>123.00</td>
</tr>
<tr>
<td>Flex % USD/MWh</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Applied price USD/MWh</td>
<td>110.00</td>
<td>115.00</td>
<td>117.00</td>
<td>120.00</td>
<td>123.00</td>
</tr>
</tbody>
</table>

| Operational Expenditure | | |
|-------------------------|---|
| Fixed Costs | | |
| Labour GBP M p.a. | 0.50 |
| Land & Leasing GBP M p.a. | 1.00 |
Main components of project finance models - construction worksheet

- It includes the costs and spending profile during the construction phase. In addition, it can include contingency costs to account for potential cost overruns.
- It also provides information on how the project is financed (equity / debt) and how much financing needs to be available for each time period.
Main components of project finance models - operations worksheet

- It calculates the revenue generated by the project.
- It also calculates the relevant variable and fixed costs of production for each time period.
- The worksheet needs to be able to integrate any potential inflation (cost escalation) during the operation phase of the project.
Main components of project finance models - debt financing worksheets

- It models how the debt financing will be serviced and repaid during the life of the project.
- It includes the base rate estimation for each time period during the life of the loan (relevant for floating rate loans).
- It also integrates the “grace period” when the project does not need to start making repayments for the loan yet.
Main components of project finance models – equity financing worksheets

- It calculates the profitability of the project for shareholders (i.e. equity investors).
- It also calculates the dividend generated by the project, which can either be reinvested in the project or withdrawn.
- It includes the IRR and NPV calculations.
Section 3
Integrating environmental and social considerations in financial models

The following slides explain our approach of integrating externalities using our Sustainable Asset Valuation (SAVi) methodology.
Our approach: Sustainable Asset Valuation (SAVi)

Characteristics

- Based on systems thinking, system dynamics simulation, spatial modelling and financial modelling.
- Customized to each individual infrastructure project or policy.
- Co-created through a multi-stakeholder approach that enables the identification of material risks and opportunities that are unique to the project.
- Incorporate best-in-class climate data from the EU Copernicus Climate Data Store.
Core Features of SAVi: Simulation

SAVi combines the outputs of systems thinking, and system dynamics simulation, spatial models and financial models to assess the value and performance of infrastructure projects.

The System Dynamics simulation uses Vensim. The financial model is built in Excel following F1F9 FAST best practices. The spatial modelling uses GIS and InVEST. You can watch a short video about the methodology here.

SAVi simulates how the costs of material risks and externalities affects the following financial performance indicators:

- Levelized costs
- Net Present Value (NPV)
- Internal Rate of Return (IRR)
- Gross Margin
- Debt Service Coverage Ratio (DSCR)
- Loan Life Coverage Ratio (LLCR)
Core Features of SAVi: Valuation - Cost of Externalities

Potential positive and negative externalities:

SAVi identifies, quantifies and explains how externalities today can transform into material risks tomorrow. Such valuations help stakeholders make decisions in favor of sustainable infrastructure.

Environmental: water and air pollution, greenhouse gas emissions, degradation or rehabilitation of land and habitats, deforestation or reforestation, biodiversity impact.

Social: Loss of traditional jobs, generation of new jobs, increase and decrease of wages, impacts on human health and health costs, effects on urbanisation trends and rural livelihoods, impacts on public space, social conflicts, contribution to education and skills building.

Economic: Contribution to economic development, effects on land and real estate prices, revenues in affected sectors, new trade opportunities, commercialisation and acceleration of technological innovation.
SAVi financial models

- The financial model used in SAVi is built in Microsoft Excel and follows F1F9 FAST best practices in order to improve the readability and auditability of the model by a third party.

- The outputs of the system dynamics model are used as inputs in the financial model. The system dynamics model quantifies and monetizes the relevant environmental, social, and economic externalities associated with the project.

- It also defines what scenarios to use in the financial model. Depending on the purpose of the assessment and the target audience, some of the externalities are included as costs or benefits. Outputs of the system dynamics model can also change some of the key assumptions of the financial model.
The financial model extends the integrated cost benefit analysis to account for inflation and the time value of money. It is used to calculate key financial indicators such as IRR and NPV.
The purpose of integrating environmental, social and economic externalities is to inform capital allocation of governments and investors when taking a more holistic approach to project selection, design and development.

The list of externalities that are appropriate to include in the financial model depends on the user and the target audience of the financial model.

- The reason for this is that the financial model would treat these externalities as cash flows and therefore affect the risk-return profile of the project, including its financial indicators such as the IRR and NPV.
Integrating environmental and social considerations in financial models (2)

• For **governments** taking a more holistic approach is normally not an issue, as they are by nature expected to apply “systemic perspectives” when making decisions on infrastructure.

• On the other hand, for **investors**, whose mandate is to generate a financial return, using this approach would only make sense for externalities that could potentially have a cash flow impact during the life of the project.

• A **carbon tax** would be a good example. If it was implemented, it would indeed have a cash flow impact at the project level. On the other hand, integrating the positive economic contribution of the project same way, for example, would be hard to justify for an investor.

• In this case, the integration of externalities in the cash flow statement would be more appropriate. This approach would avoid changing the taxable income, alongside other key modelling components, and keep externalities “outside the model,” while still allowing the calculation of a sustainable internal rate of return.
Integrating environmental and social considerations in financial models (3)

- Externalities can be integrated either as costs or benefits (“revenue”) in the financial model.
- In example on the left externalities have been integrated as costs: see “SAVi externalities” row (currently at zero on the screenshot). Externalities have been calculated on a per MWh basis in line with the variable operating costs.

<table>
<thead>
<tr>
<th>Operational Expenditure</th>
<th>Fixed Costs</th>
<th>Variable Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Labour</td>
<td>GBP M.p.a.</td>
</tr>
<tr>
<td></td>
<td>Land &amp; Leasing</td>
<td>GBP M.p.a.</td>
</tr>
<tr>
<td></td>
<td>Regular Maintenance</td>
<td>GBP M.p.a.</td>
</tr>
<tr>
<td></td>
<td>Insurance</td>
<td>GBP M.p.a.</td>
</tr>
<tr>
<td></td>
<td>Fixed O&amp;M</td>
<td>GBP M.p.a.</td>
</tr>
<tr>
<td></td>
<td>Spare</td>
<td>GBP M.p.a.</td>
</tr>
<tr>
<td></td>
<td>Spare</td>
<td>GBP M.p.a.</td>
</tr>
<tr>
<td></td>
<td>Variable Costs</td>
<td>GBP / MWh</td>
</tr>
<tr>
<td></td>
<td>SAVi externalities</td>
<td>GBP / MWh</td>
</tr>
<tr>
<td></td>
<td>Spare</td>
<td>GBP / MWh</td>
</tr>
</tbody>
</table>
The following slides explain financial modelling for NBI using a SAVi assessment of an NBI project as an example.
Financial modelling for NBI

- A financial model for nature-based infrastructure might differ significantly from that of traditional grey infrastructure.
  - As these projects generally rely on philanthropic and concessional sources of financing, a typical project finance structure might not be appropriate in most cases.
  - However, as stakeholders are increasingly treating NBI as just another form of infrastructure, the use of project finance may be used more frequently.

- NBI projects often do not generate revenue in the traditional sense of incoming cash flows. Instead, they provide a range of direct benefits for different stakeholders as well as externalities in the form of avoided costs and added benefits. This means that financial models for NBI can be simplified in some areas.
**SAVi Assessment in Indonesia**

**Maintaining and Enhancing Water Yield through Land & Forest Rehabilitation**

**Land Restoration**
Reforestation/improved management of 3,697 ha in the buffer zone
Avoided loss of 22,336 ha of forest

Outcomes:
• Nutrient removal
• Sediment retention
• Carbon sequestration
• Income from agroforestry and bamboo production

**Water Management**
597 absorption wells (2 x 2 x 2 m)
8,000 biopori (10 cm across, 80-100 cm deep)

Outcomes:
• Groundwater recharge
• Flood mitigation
SAVi Assessment Goals

Quantify the costs, benefits, and financial performance of forest restoration and water management

Assess the impact on downstream water availability if land restoration occurs on a large scale

Identify mechanisms to fund reforestation
Financial Analysis Methods

Sustainable and conventional net present value and internal rate of return

• Conventional indicators (NPV and IRR)
  o Include only cash flows to calculate financial indicators
• Sustainable indicators (S-NPV and S-IRR)
  o Include externalities and avoided costs in calculations
• Goals
  o Assess value for society over the project lifespan
  o Determine the importance of externalities and avoided costs in value creation
# Financial Analysis Scenarios

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>All benefits included</td>
<td>Includes all indicators from the integrated CBA, inflated and discounted to present values</td>
</tr>
<tr>
<td>Investment opportunity cost</td>
<td>Includes an investment opportunity cost, representing the cost of not investing in other projects</td>
</tr>
<tr>
<td>Exclude carbon storage benefit</td>
<td>Includes all indicators from the integrated CBA except carbon storage</td>
</tr>
<tr>
<td>Exclude avoided costs</td>
<td>Includes only cash flows (i.e., the added benefits and investment and maintenance costs)</td>
</tr>
<tr>
<td>Exclude carbon and avoided costs</td>
<td>Includes only cash flows, exclusive of carbon storage</td>
</tr>
</tbody>
</table>
Cumulative Present Value

Explanation of graph

Extreme rainfall has large impact on S-NPV.

For the first ten years, carbon storage dominates the shape of the curve.

After the first ten years, avoided costs dominate.
## Financial Analysis Results (USD thousands)

<table>
<thead>
<tr>
<th>Project lifetime</th>
<th>20-year lifetime (2021-2040)</th>
<th>30-year lifetime (2021-2050)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Climate Scenario</td>
<td>RCP 4.5</td>
</tr>
<tr>
<td><strong>All benefits</strong></td>
<td>S-NPV</td>
<td>63,539</td>
</tr>
<tr>
<td></td>
<td>S-IRR</td>
<td>62.8%</td>
</tr>
<tr>
<td><strong>Investment opportunity cost</strong></td>
<td>S-NPV</td>
<td>50,862</td>
</tr>
<tr>
<td></td>
<td>S-IRR</td>
<td>44.0%</td>
</tr>
<tr>
<td><strong>No carbon storage benefit</strong></td>
<td>S-NPV</td>
<td>41,850</td>
</tr>
<tr>
<td></td>
<td>S-IRR</td>
<td>56.5%</td>
</tr>
<tr>
<td><strong>No avoided costs</strong></td>
<td>S-NPV</td>
<td>13,359</td>
</tr>
<tr>
<td></td>
<td>S-IRR</td>
<td>22.5%</td>
</tr>
<tr>
<td><strong>No carbon storage benefit or avoided costs</strong></td>
<td>NPV</td>
<td>-8,330</td>
</tr>
<tr>
<td></td>
<td>IRR</td>
<td>-11.0%</td>
</tr>
</tbody>
</table>
The project generates high societal value, but this is only realized if carbon storage and/or avoided costs are included in the analysis.

Carbon financing plays an important role in making the project financially attractive.

When all benefits and avoided costs are monetized, the project demonstrates value for money after four years.
Conclusion

• Environmental and social externalities can have a material impact on the financial performance of the project once internalized.

• Integrating externalities in feasibility studies enables a more holistic decision making and a more efficient resource allocation.

• Project finance structures are becoming increasingly relevant for NBI as the value generated by these projects are monetized.

As part of Module 5 Block 2 we will discuss the challenges and potential solutions of financing NBI.
What’s next?

This was Block 1 of Module 5.

In case you want to learn more please download the full financial model used for the Indonesian SAVi assessment discussed in this slidedeck.

You can continue the course with

Module 5 – Block 2 about financing NBI