Toolkit for Access to Finance (A2F) Training

1. Introduction of Bankable Project
2. Comparing Different Financing Options
3. Calculating the Cash Flow
4. Calculating the Simplified Cash Flows
Introduction of bankable project

Training on bankable projects, Sri Lanka
What is a bankable project?

A bankable project has to…

…convince the lender that his investment is profitable and not too risky.
Loan eligibility criteria

- Implemented in a region or **country** qualified for funding.
- Belonging to a **sector** qualified for funding.
- Apply proven or innovative **technology**.
- Have competent and convincing **staff** in operation.
- Outline a long term **source for cash generation**.
What needs to be considered

- **Location**
  - Country or region where project is implemented

- **Entity**
  - Some loans are restricted to specific legal (e.g. to public institutions)

- **Size of company and investment**
  - Required standards for determining size (e.g. *Industrial Enterprises Act 2073 (2016)*)
  - Grant rate (percentage of grant to total investment) depends on company’s size (e.g. 30% for small, 20% for medium, 15% for large companies)
  - Grant size limit (e.g. NPR 10 million for *Financing Energy Efficiency Programme Nepal*)
  - Investment cost limit (e.g. minimum NPR 1 million for *Financing Energy Efficiency Programme Nepal*)
What needs to be considered

- **Sector**
  - Some loans are restricted to specific sectors (e.g. renewable energy)
  - Some loans exclude particular sectors (e.g. firearms)

- **Investment**
  - Total amount of investment
  - Listing all different kind of costs (also operating costs in future)
  - Possibly attaching offers of equipment suppliers for specific investment
  - Schedule for implementation of investments

- **Benefits**
  - e.g. energy savings
  - List all assumptions required for calculation of savings

- **Technology**
  - Proven to be successful or innovative?
What needs to be considered

- **Financial plan**
  - Costs (relevant to whole project and not only particular investment)
  - Revenues (turnover, profit margins)
  - Outline a long term *source for cash generation*.

- **Sector analysis**
  - Competitors
  - Market opportunities
  - Development prospects
  - Risk assessment
Comparing Different Financing Options

Training on Bankable Energy Efficiency and Cleaner Production Projects
I want to make an RECP investment
• Improved production machinery
• Reduced electricity costs
• Lower emissions

Investment costs money
• Small amount
• Significant amount

Need financing
How do we finance the investment?

Training on Financing Options

Project Funded by

Project Implemented by
Comparing Financing Options: 3 Steps

1. Determine Investment’s Cost
2. Choose funding type
3. Choose appropriate funder
Step 1: Determine Investment’s Cost

How cost-intensive is the investment?

• Not all RECP measures are suitable for attracting external finance.
• No- and low-cost options should be realised from the company’s own capital stock.
• Measures with high saving potential are more likely to attract external finance than those with lower saving potential.
Step 1: Determine Investment’s Cost

How much money does the investment require?

None
  - Just do it!

Little
  - Can I finance it myself?
    - Yes: Just do it!
    - No: External Funding is Needed

A lot
  - Can I finance it myself?
    - Yes: Just do it!
    - No: External Funding is Needed

"Just do it!" = use internal funding sources available, such as Retained Profits or Initial Capital.

Training on Financing Options

1. Determine Investment’s Cost
2. Choose funding type
3. Choose specific funder
Step 2: Choosing a Funding Type

See which type of funding is available in your region/for your sector

| Public bodies (grant or loan) | Funds (grant or loan) | Banks (loan) | Corporate investors (equity or loan) | Impact investors (equity or loan) |

Analyse the pros and cons of each

Choose the best fit based on:

| Entrepreneurial stage | Current loans | Desired management control |

Training on Financing Options

1. Determine Investment’s Cost
2. Choose funding type
3. Choose specific funder
Step 2: Choosing a Funding Type

- **Grants** are ideal financially, but the enterprise must match the specific grant goals, meaning:
  - Extensive research on the funder & an outstanding application is required.
  - There are limitations as to how the funds can be used.
- **Loans** are ideal for freedom with fund usage, but are financially restrictive.
- **Equity** also does not require strict repayment, but the relationship with the investor is intense.
## Step 2: Choosing a Funding Type - Overview

<table>
<thead>
<tr>
<th>Factors</th>
<th>Grant</th>
<th>Loan</th>
<th>Equity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash needed for repayment</td>
<td>No</td>
<td>Yes</td>
<td>No (except dividend when profits are made)</td>
</tr>
<tr>
<td>Control of company given up</td>
<td>Depends on terms</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Freedom in usage of funds</td>
<td>Low</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Time Frame</td>
<td>Short</td>
<td>Long</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Entrepreneurial stage</td>
<td>Early</td>
<td>Early</td>
<td>Later</td>
</tr>
<tr>
<td>Collateral necessary</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Training on Financing Options

1. Determine Investment’s Cost
2. Choose funding type
3. Choose specific funder
Step 3: Choosing the Appropriate Funding Scheme

Once the funding type has been chosen, the enterprise should consider the following criteria when selecting a funder (ranked in order of importance):

- **Grant**
  - 1) Match goals
  - 2) Amount of funding offered
  - 3) Likelihood of application success

- **Loan**
  - 1) Most financially attractive
  - 2) Lowest interest rate: banks offer lowest interest rate but require a stronger credit history
  - 3) Term length matches the enterprise’s funding needs

- **Equity**
  - 1) Match overall goals
  - 2) Cooperation: can I get along with this investor for a long period of time?
  - 3) Financial terms trade off with management control: how much am I willing to give up in exchange for higher amounts of funding?

1. Determine Investment’s Cost
2. Choose funding type
3. Choose specific funder

Training on Financing Options
Step 3: Choosing the Appropriate Funding Scheme

Compare different schemes in your region/your sector

- What type of **grants for RECP projects** are available in Sri Lanka?
  - ....
  - ....

- What type of **loan schemes** that match my project’s characteristic are available?
  - ....
  - ....
  - ....

Training on Financing Options

1. Determine Investment’s Cost
2. Choose funding type
3. Choose specific funder

Project Funded by

Project Implemented by
# Examples of finance schemes

<table>
<thead>
<tr>
<th>Loan Scheme Title</th>
<th>E-Friend II (Revolving Fund)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managed by</td>
<td>Ministry of Industry and Commerce</td>
</tr>
<tr>
<td>Type &amp; Validity</td>
<td>General Loan scheme</td>
</tr>
<tr>
<td>Sector</td>
<td>Any sector</td>
</tr>
<tr>
<td>Specific Eligibility Criteria</td>
<td>E-friends-II loan scheme provides low cost loans to entrepreneurs that want to find out solutions to the environment problems such as industrial pollutions caused by their manufacturing, waste minimization, resource recovery and savings, pollution control and abatement measures and associated design, energy consumption and for environmental improvement initiatives.</td>
</tr>
<tr>
<td>Weblink</td>
<td><a href="http://www.industry.gov.lk/web/">http://www.industry.gov.lk/web/</a></td>
</tr>
<tr>
<td>Loan</td>
<td>Up to LKR 30 Million</td>
</tr>
<tr>
<td>Repayment</td>
<td>Up to 10 years</td>
</tr>
<tr>
<td>Interest Rate</td>
<td>6.5%</td>
</tr>
</tbody>
</table>
### Examples of finance schemes

<table>
<thead>
<tr>
<th>Loan Scheme Title</th>
<th>Jaya Isura 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managed by</td>
<td>Ministry of Finance and Mass Media</td>
</tr>
<tr>
<td>Type &amp; Validity</td>
<td>Loan</td>
</tr>
<tr>
<td>Sector</td>
<td>Small scale industries including agriculture, fisheries, garments, information technology and production industry</td>
</tr>
<tr>
<td>Specific Eligibility Criteria</td>
<td>Small entrepreneurs engage in the above fields and whose annual turnover is from Rs. 10 million to Rs. 250 million with 5-50 of employees can obtain a loan. As the 50 percent of the interest is paid by the government the interest rate to be paid by the party that obtains the loan is 6.75 percent.</td>
</tr>
<tr>
<td>Weblink</td>
<td><a href="https://www.peoplesbank.lk/development-loan-schemes">https://www.peoplesbank.lk/development-loan-schemes</a></td>
</tr>
<tr>
<td>Loan</td>
<td>Up to LKR</td>
</tr>
<tr>
<td>Repayment</td>
<td>Up to 5 years</td>
</tr>
<tr>
<td>Interest Rate</td>
<td>6.75%</td>
</tr>
</tbody>
</table>
## Examples of finance schemes

<table>
<thead>
<tr>
<th>Loan Scheme Title</th>
<th>Diribala Development Loans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managed by</td>
<td>Commercial Bank</td>
</tr>
<tr>
<td>Type &amp; Validity</td>
<td>Loan</td>
</tr>
<tr>
<td>Sector</td>
<td>Small and medium scale agricultural, <strong>industrial</strong> and business ventures</td>
</tr>
<tr>
<td>Specific Eligibility Criteria</td>
<td>Individuals, Sole proprietorship, Partnership, Limited liability companies who are engaged in or to be engaged in manufacturing, services, and trading oriented businesses, with an adequate repayment capacity is eligible to apply for a Diribala Development Loan.</td>
</tr>
<tr>
<td>Loan</td>
<td>Up to a maximum of 75% of the total investment in the project</td>
</tr>
<tr>
<td>Repayment</td>
<td>Up to 7 years</td>
</tr>
<tr>
<td>Interest Rate</td>
<td>16.5%</td>
</tr>
</tbody>
</table>
Step 3: Choosing the Appropriate Funding Scheme

- Banks usually offer different loan schemes. For comparing and assessing loan schemes, the following information might be relevant:
  - Who manages the scheme? (name of the bank)
  - Until what date is it valid?
  - What type of investments can be financed under the scheme? (e.g. only solar energy projects)
  - What is the minimum assistance?
  - What is the interest rate?
  - What is the maximum payback time?
Step 3: Choosing the Appropriate Funding Scheme

Identify the terms of the schemes

• Taking a loan for a specific investment or project influences the company’s cash flow.

• The loan is taken up to provide finance for an investment, but at the same time, it generates additional costs:
  – Interest payments
  – Annual repayments
Step 3: Choosing the Appropriate Funding Scheme

- In order to compare different loans, it is useful to find out about the following loan conditions for each loan, respectively.
  - Interest rate
  - Maturity
  - Rate of repayment
When businesses need funds for an investment they may use debt financing if they are sufficiently creditworthy. These debt financing transactions appear on the cash flow statement and on the balance sheet.

Off-balance sheet financing is a legitimate accounting method to reduce or maintain a company's debt at or below a prescribed level so that its debt-to-equity ratio is low.

When a company has a favourable ratio, that company appears to be a good credit risk.
Resource-Efficient Supply Chains for Metal Products in Buildings Sector in South Asia

Simplified Cash Flows

Training on bankable projects
Investments

- An investment often requires more cash than it seems at first sight.
- Indeed, the cost of the investment is **not only the price of the item bought.**
- An investment may generate **additional costs**, e.g. for installation, or by changing the **operating costs** of the company (by requiring more/less manual labour, raw materials, energy etc.)
- All this information has to be considered to find out whether a specific investment / project yields positive or negative cash flows throughout its **lifetime**.
This tool is composed of a presentation and an Excel Worksheet.

- The Excel Worksheet already contains the relevant formulas.
- Make sure to **only change the figures in the cells which are coloured in ORANGE.**
- All other figures are calculated automatically.
Simplified Cash Flows: Step-by-Step Guide

**Step 1**: Collect investment costs

**Step 2**: Collect operating costs

**Step 3**: Calculate savings

**Step 4**: Derive Cash Flow
Step 1 - Collect investment costs

At the beginning of the project / investment, various one-time costs might occur.

This means that these costs will only influence the cash flows of the company in the year where the investment is made.

<table>
<thead>
<tr>
<th>Cost item</th>
<th>Relevant?</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feasibility study</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Raw materials</td>
<td>✓</td>
<td>10,000,000</td>
</tr>
<tr>
<td>Delivery</td>
<td>✓</td>
<td>300,000</td>
</tr>
<tr>
<td>Installation</td>
<td>✓</td>
<td>4,000,000</td>
</tr>
<tr>
<td>Training</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>14,300,000</strong></td>
</tr>
</tbody>
</table>

Example: Add insulation to an inefficient furnace
Step 1 - Collect investment costs

Task

• Collect the investment costs in the „Investment Costs“ table.
• List potential cost items in the first column.
→ Note that this table should only include one-time costs related to the investment and not operating costs.
• Check whether all listed cost items are relevant in the specific case.
• Identify costs for each cost item.
• All relevant costs listed in the table are added up to obtain the total amount of investment costs.
Step 1 - Collect investment costs

List of some investment costs you might have to consider:

<table>
<thead>
<tr>
<th>Cost item</th>
<th>Relevant?</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifying solution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purchase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delivery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Installation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IT configuration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total costs</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Step 2 - Collect operating costs

Besides generating initial one-time costs, most new projects / investments also influence the company’s **operating costs throughout their lifetime.**

→ An investment might either **change (increase or reduce) the operating costs** of an existing equipment.
  
  • e.g. reduced energy costs due to the installation of insulation or the replacement of inefficient machinery

AND / OR

→ The investment might lead to **new operating costs** which the company did not have before
  
  • e.g. the installation of a new water treatment plant where no such plant existed before might call for new electricity expenses.
The questions in the table below help you to identify which operating costs will change after the investment:

<table>
<thead>
<tr>
<th>Operating cost item</th>
<th>Is it a reduction in existing costs?</th>
<th>Is it an increase in existing costs?</th>
<th>Are they entirely new costs?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy consumption</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labour</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Raw materials for maintenance</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Step 2 - Collect operating costs

Task

• **List all operating costs** likely to be *generated by the investment / project in the future*.
  – Note that operating cost items cannot be the same as investment cost items.
  – You **do not need to quantify these costs yet**, this will be done in the next step.

• Differentiate between
  – Changes (reduction or increase) in existing operating costs AND
  – Operating costs that are “new”
### List of some operating costs you might have to consider:

<table>
<thead>
<tr>
<th>Operating cost item</th>
<th>Is it a reduction in existing costs?</th>
<th>Is it an increase in existing costs?</th>
<th>Are they entirely new costs?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy consumption</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Consumption</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labour</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjustment of other workflows</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training new staff</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Software updates</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>...?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Step 3 - Calculate savings

The savings from a specific investment / project are the difference between operating costs without and with the investment.

<table>
<thead>
<tr>
<th>Operating cost item</th>
<th>Operating costs with investment</th>
<th>Operating costs without investment</th>
<th>Change in costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy consumption</td>
<td>1,100,000</td>
<td>3,500,000</td>
<td>- 2,400,000</td>
</tr>
<tr>
<td>Labour</td>
<td>500,000</td>
<td>400,000</td>
<td>+ 100,000</td>
</tr>
<tr>
<td>Raw materials for maintenance</td>
<td>200,000</td>
<td>0</td>
<td>+200,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total change in operating costs</strong></td>
<td></td>
<td></td>
<td><strong>- 2,100,000</strong></td>
</tr>
</tbody>
</table>

Example: Add insulation to an inefficient furnace

Simplified Cash Flows
Step 3 - Calculate savings

• Note that
  – a **positive (+)** change in costs indicates **additional costs** (expenses)
  – a **negative (-)** change in costs indicates **reduced costs** (savings)
• The operating costs can refer to the entire company, to one factory, one machine or one productions step.
• **BUT:** To be comparable, the costs with and without the investment have to refer to the **same reference point** (company etc.) and the **same timeframe**!
Step 3 - Calculate savings

Task

- Fill in the “Operating Costs” table (keep in mind to use coherent timeframes and reference points)
- List and quantify the “Operating costs with investment” identified in Step 2
- Quantify the “Operating costs without the investment”
- The “change in costs” has been calculated automatically in the Excel Worksheet.

Analyse and discuss the findings:

- a negative result means a reduction in costs (SAVINGS)
- a positive result means an increase in costs with the investment

### Operating costs - recurring

<table>
<thead>
<tr>
<th>Operating cost item</th>
<th>Operating costs with investment</th>
<th>Operating costs without investment</th>
<th>Change in costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>energy consumption</td>
<td>1.100.000</td>
<td>3.500.000</td>
<td>-2.400.000</td>
</tr>
<tr>
<td>labour</td>
<td>500.000</td>
<td>400.000</td>
<td>100.000</td>
</tr>
<tr>
<td>raw materials</td>
<td>200.000</td>
<td>0</td>
<td>200.000</td>
</tr>
</tbody>
</table>

Total change in costs: -2.100.000
Step 4 - Derive a cash flow

- The **cash flow related to the specific** investment describes if you are actually making or loosing money with the investment in a given year.
- They are derived from the **difference** between **cost savings / additional expenses of operating costs** and **investment costs** in a given year.

Cash flow in year $x =$
Savings OR Additional expenses in operating costs with investment in year $x$
$- \text{ investment costs in year } x$
Step 4 - Derive a cash flow

- In this presentation, we consider that the investment does not generate operating costs in year zero. Therefore, **cash flows in year zero are only the investment costs**.
- We also assume that the investment will generate the **same operating costs throughout its lifetime**.
- After the end of the investment’s lifetime, its operating costs will be zero and there will be no cash flow related to this specific investment.
Step 4 - Derive a cash flow

Cash Flows:

- Investment costs

+ Total savings from operating costs

- Total additional expenses from operating costs

If the total change in costs is negative, e.g. -40, costs have been reduced by 40. This equals cost savings of +40.

OR

If the total change in costs is positive, e.g. +40, costs have increased by 40. This equals additional expenses of -40.
Step 4 - Derive a cash flow

- Finally, remember that the cash flows related to one specific investment are not the same as the cash flows for the whole company.
- When doing a Cost-Benefit Analysis, the cash flows from one specific investment can be used as the so-called "incremental cash flow".
- The "incremental cash flow" is the difference between an entire company’s cash flows without an investment (called “business as usual”) and this same company’s cash flows with the specific investment, over the project’s lifetime.
Step 4 - Derive a cash flow

Task

• Enter the expected lifetime of the project in the relevant section
  – This is the duration over which cash flows related to this specific investment can be projected.

• Analyse and discuss the cash flows generated by the Excel Worksheet. Note that:
  – Cash flows might be either positive or negative.
  – this worksheet does not generate information on a company’s entire cash cycle but only on the cash flow from the specific investment / project.
  – These are only simplified cash flow projections.
Step 4 - Derive a cash flow

### Simplified Cash Flows

<table>
<thead>
<tr>
<th>Investment costs - one time</th>
<th>Operating costs - recurring</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Investment cost item</strong></td>
<td><strong>Operating cost item</strong></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>raw materials</td>
<td>energy consumption</td>
</tr>
<tr>
<td>delivery</td>
<td>labour</td>
</tr>
<tr>
<td>installation</td>
<td>raw materials</td>
</tr>
</tbody>
</table>

| Total                        | Total change in costs       | -2.100.000               |

**Expected lifetime (in years)**: 7

*Positive cash flows after investment*
### Step 4 - Derive a cash flow

#### Investment costs - one time

<table>
<thead>
<tr>
<th>Investment cost item</th>
<th>Relevant?</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feasibility study</td>
<td>Yes</td>
<td>800.000</td>
</tr>
<tr>
<td>Raw Material</td>
<td>Yes</td>
<td>200.000</td>
</tr>
<tr>
<td>delivery</td>
<td>Yes</td>
<td>30.000</td>
</tr>
<tr>
<td>installation</td>
<td>No</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>1.030.000</td>
</tr>
</tbody>
</table>

#### Operating costs - recurring

<table>
<thead>
<tr>
<th>Operating cost item</th>
<th>Operating costs with investment</th>
<th>Operating costs without investment</th>
<th>Change in costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>energy consumption</td>
<td>1.100.000</td>
<td>1.200.000</td>
<td>-100.000</td>
</tr>
<tr>
<td>labour</td>
<td>500.000</td>
<td>400.000</td>
<td>100.000</td>
</tr>
<tr>
<td>raw materials</td>
<td>200.000</td>
<td>0</td>
<td>200.000</td>
</tr>
<tr>
<td><strong>Total change in costs</strong></td>
<td></td>
<td></td>
<td>200.000</td>
</tr>
</tbody>
</table>

#### Cash Flows related to the investment

<table>
<thead>
<tr>
<th>Year</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
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<tbody>
<tr>
<td>Cash Flows</td>
<td>-1.030.000</td>
<td>-200.000</td>
<td>-200.000</td>
<td>-200.000</td>
<td>-200.000</td>
<td>-200.000</td>
<td>-200.000</td>
<td>-200.000</td>
</tr>
</tbody>
</table>

Simplified Cash Flows

Negative cash flows after investment
Calculating the Payback Period

Training on Bankable Energy Efficiency and Cleaner Production Projects
Work with the Excel Worksheet

• This tool is composed of a presentation and an Excel Worksheet:

  ![Excel Worksheet Image]

• Excel Worksheet already contains the relevant formulas.
• Make sure to **only change the figures in the cells that are coloured in ORANGE**.
• All other figures are calculated automatically.
• There is **space for comparing up to 4 investments**. Click the “+” sign above columns L, R and X in order to display them.

Payback Period
Why Calculate the Payback Period?

The Payback Period is a **simple** investment tool for business managers to help decide **whether to realize an investment or not!**

**Investment A?**
- Costs X
- Revenues X

**Investment B?**
- Costs Y
- Revenues Y

**Investment C?**
- Costs Z
- Revenues Z

**How to choose?**

---

Payback Period

Project Funded by

Project Implemented by
Payback Period

• The Paypack Period is the simplest one out of various investment tools that can be used. BUT:
  – Limited in use because it doesn’t consider Time Value of Money, Risk, etc.
  – Using only the Payback Period does not give an objective criterion as to whether or not an investment should be made. It should be combined with other criteria.

• The Payback Period can ONLY be used:
  – As a standalone metric or in comparison to other Payback Periods
  – As a (vague) general assessment of a certain investment (e.g. when the investment is small and a sophisticated financial analysis is not worth it)
  – When a Payback Period threshold for project acceptance has been set in advance
  – When cash is an important factor in final project choice
What is the Payback Period?

• The **Breakeven Point** of an investment is when an investment „pays for itself“

• It is expressed in **time units** (usually years):
  – “It will take 2,5 years for this machine to produce the same amount of profit that it cost to buy the machine itself.”

• When comparing investments, those with a **shorter Payback Period** will be chosen over those with a longer Payback Period
Example 1

• **Investment A** costs 1,000,000 LKR now
  - It will generate 500,000 LKR in revenues each year into the future
    • Year 1 revenue: 500,000 LKR +
    • Year 2 revenue 500,000 LKR = 2 years to pay off the original 1,000,000 LKR investment
  → Payback Period = 2 years

• **Investment B** also costs 1,000,000 LKR now
  - It will generate 250,000 LKR in revenues each year into the future
    • Year 1 revenue 250,000 LKR +
    • Year 2 revenue 250,000 LKR +
    • Year 3 revenue 250,000 LKR +
    • Year 4 revenue 250,000 LKR = 4 years to pay off the original 1,000,000 LKR investment
  → Payback Period = 4 years

→ **Investment A** is preferred because it **pays off** the original investment **faster**
Payback Period

Example 2

• **Investment A** costs 1,000,000 LKR now
  – It will generate 500,000 LKR in revenues each year into the future
    • Year 1 revenue 500,000 LKR +
    • Year 2 revenue 500,000 LKR = 2 years to pay off the original 1,000,000 LKR investment
  → Payback Period = 2 years

• **Investment B** costs 500,000 LKR now
  – It will generate 100,000 LKR in revenues each year into the future
    • Year 1 revenue 100,000 LKR +
    • Year 2 revenue 100,000 LKR +
    • Year 3 revenue 100,000 LKR +
    • Year 4 revenue 100,000 LKR +
    • Year 5 revenue 100,000 LKR = 5 years to pay off the original 500,000 LKR investment
  → Payback Period = 5 years

→ **Even though it is more expensive**, based on the Payback Period, **Investment A** is preferred because it **pays off** the original investment **faster**
Calculating the Payback Period: Step-by-Step Guide

Step 1: Calculating the Payback Period with **even** cash flows

Step 2: Calculating the Payback Period with **uneven** cash flows

Step 3: Decision-making with Payback Period
Step 1: Payback Period with even Cash Flows

- Cash Flows are even if they are the same during the entire lifetime of the investment.
  - E.g. in a case where the investment is a machine that will produce a constant amount of units (or generate constant cost savings), future periodic Cash Flows are all equal.

- The Payback Period is then calculated by:

  \[
  \text{Payback Period} = \frac{\text{Initial Investment Cost}}{\text{Periodic (Annual) Cash Flow}}
  \]

(Previous examples: 1,000,000 LKR/500,000 LKR = 2 years; 1,000,000 LKR/250,000 LKR = 4 years; 500,000 LKR/100,000 LKR = 5 years)
Step 1: Payback Period with even Cash Flows

<table>
<thead>
<tr>
<th>Year</th>
<th>Cash Flow</th>
<th>Cum. Cash Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>- 500,000 LKR</td>
<td>- 500,000 LKR</td>
</tr>
<tr>
<td>1</td>
<td>+ 200,000 LKR</td>
<td>- 300,000 LKR</td>
</tr>
<tr>
<td>2</td>
<td>+ 200,000 LKR</td>
<td>- 100,000 LKR</td>
</tr>
<tr>
<td>3</td>
<td>+ 200,000 LKR</td>
<td>+ 100,000 LKR</td>
</tr>
</tbody>
</table>

- Above, the investment costs are 500,000 LKR in Year 0.
- In Years 1, 2 and 3 it generates revenue for the company of the same amount each year: 200,000 LKR.
- **Cumulative cash flow** simply adds up each year’s cash flows year by year:
  - In Year 0, the only cash flow so far is the original investment of -500,000 LKR.
  - Year 1’s revenue of 200,000 LKR means that **Cumulative Cash Flow in Year 1 is equal** to 
    -500,000 LKR + 200,000 LKR = **-300,000 LKR**.
  - Year 2’s revenue of 200,000 LKR means that **Cumulative Cash Flow in Year 2 is equal** to 
    -300,000 LKR (Cumulative Cash Flow from Year 1) + 200,000 LKR = **-100,000 LKR**.
Step 1: Payback Period with even Cash Flows

Payback Period = \[ \frac{\text{Investment Cost}}{\text{Periodic (annual) Cash Flow}} \]

- The Breakeven Point is somewhere between Years 2 and 3, where the cumulative cash flows from the investment go from negative to positive, i.e. the investment has started to generate profit.

\[ \rightarrow \text{Payback Period} = \text{when the investment has “paid for itself”} \]

<table>
<thead>
<tr>
<th>Year</th>
<th>Cash Flow</th>
<th>Cum. Cash Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
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<tr>
<td>3</td>
<td>+200,000 LKR</td>
<td>+100,000 LKR</td>
</tr>
</tbody>
</table>

Payback Period = \[ \frac{500,000}{200,000} = 2.5 \text{ years} \]
Step 1: Payback Period with even Cash Flows

Task

• In the Excel worksheet, fill in the initial investment cost for Investment A (as an absolute, positive figure)
• Choose the period type from the dropdown list
• Enter the expected future Cash Flows in column C for as many time periods forward as necessary.

→ The Payback Period for the investment will be calculated in the yellow box at the top.

Note: Some investments do not directly generate additional revenues, but reduce the operating costs. E.g. a company could insulate a building and thereby reduce its electricity costs. Reduced costs enter into the cash flow used for the Payback Period just like additional revenues would!
**Step 2: Payback Period with uneven Cash Flows**

- **Uneven Cash Flows** are Cash Flows that are **not the same every year after the investment is made**.
  - This can happen e.g. when demand for the product is low directly after the investment because the public doesn’t know about it yet.
- There are **3 steps** to calculate the Payback Period with uneven Cash Flows.

1. **List** each year’s Cash Flows
2. **Add up** Cumulative Cash Flows
3. **Calculate** Payback Period using the formula

**Note:** If cumulative cash flows become negative sometime after the Payback Period, you **cannot** use the Payback Period formula as an investment tool.
Step 2: Payback Period with uneven Cash Flows

1. List Cash Flows

<table>
<thead>
<tr>
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<th>Cash Flow</th>
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<tbody>
<tr>
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<tr>
<td>3</td>
<td>+200,000 LKR</td>
<td>+150,000 LKR</td>
</tr>
</tbody>
</table>

2. Add up Cumulative Cash Flows

- Above, the investment costs are 300,000 LKR in Year 0. In Years 1, 2 and 3 it generates revenue for the company (unevenly).
- **Cumulative cash flow** adds up each year’s cash flow year by year:
  - In Year 0, the only cash flow so far is the original investment of -300,000 LKR.
  - Year 1’s profit of 100,000 means that Cumulative Cash Flow in Year 1 is equal to -300,000 LKR + 100,000 = -200,000 LKR.
  - Year 2’s profit of 150,000 LKR means that Cumulative Cash Flow in Year 2 is equal to -200,000 LKR (cumulative cash flow from the previous Year 1) + 150,000 LKR = 50,000 LKR.
Step 2: Payback Period with uneven Cash Flows

3. Calculate Payback Period

<table>
<thead>
<tr>
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</tr>
<tr>
<td>3</td>
<td>+ 200,000 LKR</td>
<td>+ 150,000 LKR</td>
</tr>
</tbody>
</table>

- The cumulative cash flows **change from negative to positive** between Years 2 and 3.
- The Payback Period lies somewhere in between - we can calculate where exactly:
- We know it’s at least **Year 2 + part of Year 3**.
  - The exact “part of Year 3” depends on how close the cumulative cash flows are to the breakeven point in Year 2 (50,000 LKR), compared to how much cash flow the investment actually generates in Year 3 (200,000 LKR).
Step 2: Payback Period with uneven Cash Flows

### 3. Calculate Payback Period

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<tr>
<td>3</td>
<td>+ 200,000 LKR</td>
<td>+ 150,000 LKR</td>
</tr>
</tbody>
</table>

Payback Period = \( A + \frac{B}{C} \)

\[
\begin{align*}
\text{Payback Period} &= 2 + \frac{50,000}{200,000} \\
&= 2.25 \text{ years}
\end{align*}
\]
Step 2: Payback Period with uneven Cash Flows

**Task**

- In the Excel worksheet, fill in the initial investment cost for Investment B, just like you did it before for Investment A.
- Change the Cash Flows: Make them uneven.

→ The Payback Period for the investment will be calculated in the yellow box at the top.
Step 3: Decision-Making with Payback Period

Accept of Reject the Investment?

<table>
<thead>
<tr>
<th>Investment A</th>
<th>Investment B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Payback Period:</strong></td>
<td><strong>Payback Period:</strong></td>
</tr>
<tr>
<td>2,50</td>
<td>2,25</td>
</tr>
<tr>
<td><strong>Initial Investment Cost</strong></td>
<td><strong>Initial Investment Cost</strong></td>
</tr>
<tr>
<td>(Absolute Value) 500.000</td>
<td>(Absolute Value) 300.000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Choose Period Type from Dropdown below:</th>
<th>Year</th>
<th>Expected Cash Flow</th>
<th>Cumulative Cash Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>-500.000</td>
<td>-500.000</td>
</tr>
<tr>
<td></td>
<td>1</td>
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<tr>
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<table>
<thead>
<tr>
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<td>150.000</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td></td>
<td>150.000</td>
</tr>
</tbody>
</table>
Step 3: Decision-Making with Payback Period

<table>
<thead>
<tr>
<th>Accept if</th>
<th>Reject if</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calculated Payback Period is:</td>
<td>Calculated Payback Period is:</td>
</tr>
<tr>
<td>• The <strong>lowest of all calculated Payback Periods</strong> of different considered investments</td>
<td>• <strong>Not the lowest</strong> of all calculated Payback Periods of different considered investments</td>
</tr>
<tr>
<td>• <strong>Less than</strong> the given Payback Period <strong>threshold</strong></td>
<td>• <strong>Greater than</strong> the given Payback Period <strong>threshold</strong></td>
</tr>
</tbody>
</table>

Use this general rule when it has been decided that Payback Period will be used as an investment criterion (when comparing to other investments, there is a payback period threshold).
Step 3: Decision-Making with Payback Period

- Payback Period is only one of many investment criteria.
- Further assessment using other investment criteria could mean that an investment with a higher payback period could be accepted in the end.
THANK YOU!