10 FINANCIAL - WINDBANK

10.1 WINDBANK – Introduction and step-by-step guide

10.1.1 Introduction to WINDBANK

The financial evaluation of a wind energy project may be the most important project development task. It is, in the end, when all needed approvals are settled, the financial circumstances of the project, which decide whether or not the project will be realized. With the windPRO module WINDBANK such a decision will be taken on a well-documented basis.

All the documentation, as well as a survey with few key figures and a complete budget, which will satisfy bankers and other qualified office managers, can be printed.

The windPRO module WINDBANK is, in the present version, furnished with a line of specific facilities which correspond to the Danish tax law, but it will operate under more general conditions when investor is located in other countries.

WINDBANK handles 4 different “owner constructions”:

Cooperatives - where special calculations for each coop can be generated
Private owned – where the owners private tax issues can be mixed with the wind farm investment
Company owned – “standard” company investment
Company coop – more companies has shares in the project, prints for a specific share is possible.

WINDBANK can also be used for economic evaluation (the value for the community), it is just a question of proper selection of the relevant input data.

The WINDBANK module is based on templates, which makes it fast to define a new calculation based on previous calculations, where only minor corrections has to be made.

10.1.2 WINDBANK Step-by step-guide

- Calculate the energy production with PARK or METEO/MODEL (to be able to transfer WTG-type, size and energy production automatically)
- Start the WINDBANK module – load a template from "Standard" or other previous calculation.
- Go through all tab-sheets in order to define all parameters.
- Calculate and Print reports.

10.2 WINDBANK – Calculation methods and key figures

10.2.1 Calculation methods

As previously mentioned, WINDBANK is furnished with special features which are constructed for calculations based on Danish regulations (especially tax regulations), but in all other cases, WINDBANK operates after the often standardized general taxation and depreciations regulations which are used in most other countries. Facilities for calculations based on specific regulations in other countries but Denmark will be developed upon request.

Basically, an annual account is divided into the following items (based on general accounting principles):

Operation budget:
+Income (sale of electricity + optionally any value of replaced consumption generated by the WTGs)
-Expenditures (O&M + Book Depreciations = reduction in the value of the Installations)
=Working Profits, Ordinary, before tax and interests

-Financing (Interests only)
-Taxation
=Working Profits

Balance budget:
ASSETS
Installations (value of hardware after Book Depreciations)
Cash Balance (amount on account where the annual liquidity is accumulated)

LIABILITIES
Net Worth (own capital)
Debts

The Annual Liquidity consists of the annual growth of the cash balance. It is important to face the difference between “operation budget” and “liquidity budget”.

The liquidity budget (or cash flow) gives the year by year amount available for investor including taxation.
The operation budget expresses the year by year value of the project. Here the depreciation reflects the annual loss in value, whereas in the liquidity budget, the depreciation is “replaced” with the annual repayment of loans and thereby the amount that “in real” is withdrawn from the cash balance.

Operation budgets as well as liquidity budgets can be printed.

10.3 WINDBANK – Entering data

10.1.0 Start the WINDBANK module

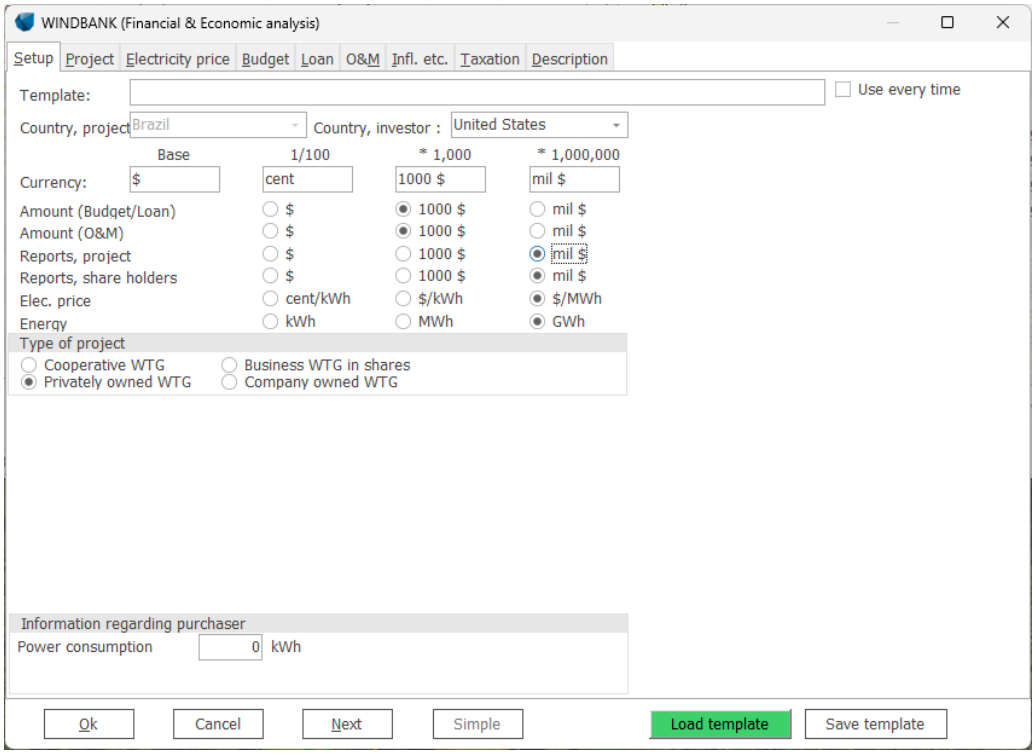
Go to the System Integration tab and click on WINDBANK

10.3.1 Setup

In Setup you specify:
Country, project; The name of the country for the project location in question has already been selected under Project Properties.
Country, Investor – gives at present only any difference if the investor is located in Denmark, while this gives access to specific Danish tax regulations.
Currency can be entered freely - this is only a text, which is appended to all printed figures. The choices for amounts/reports shall reflect the size of the project you are going to calculate.

Type of project refer to the owner type, which for some input options gives access to different features.

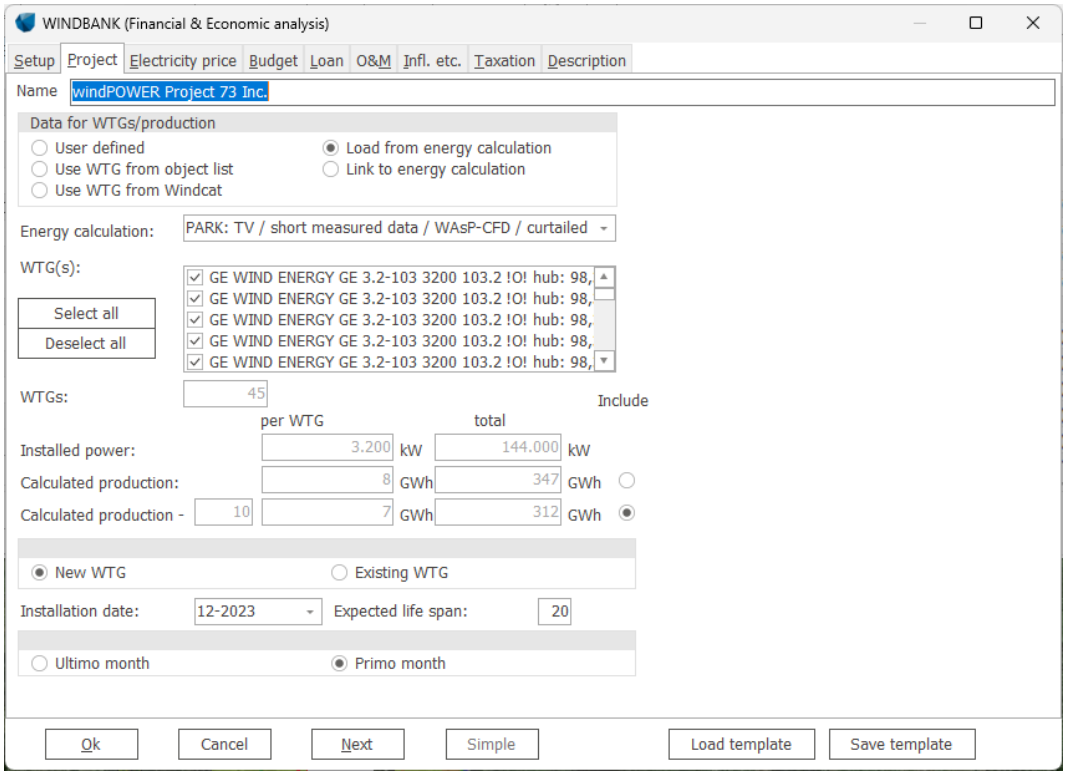
You can save this template and use it again in another calculation or project.



If you mark the 'use every time' under Template you will always begin with this template when you activate WINDBANK.

If you mark 'Cooperative owned' as project type, you must enter the size of a share (in kWh) and number of shares for the "typical" Coop you wish to make a calculation for.

10.3.2 Project



The name of the calculation will appear on all the printed pages. This can be used to specify the particulars of the calculation in question - e.g. High Inflation Rate, Low kWh Price, etc.

The data regarding the production of the WTGs can be entered in various ways:

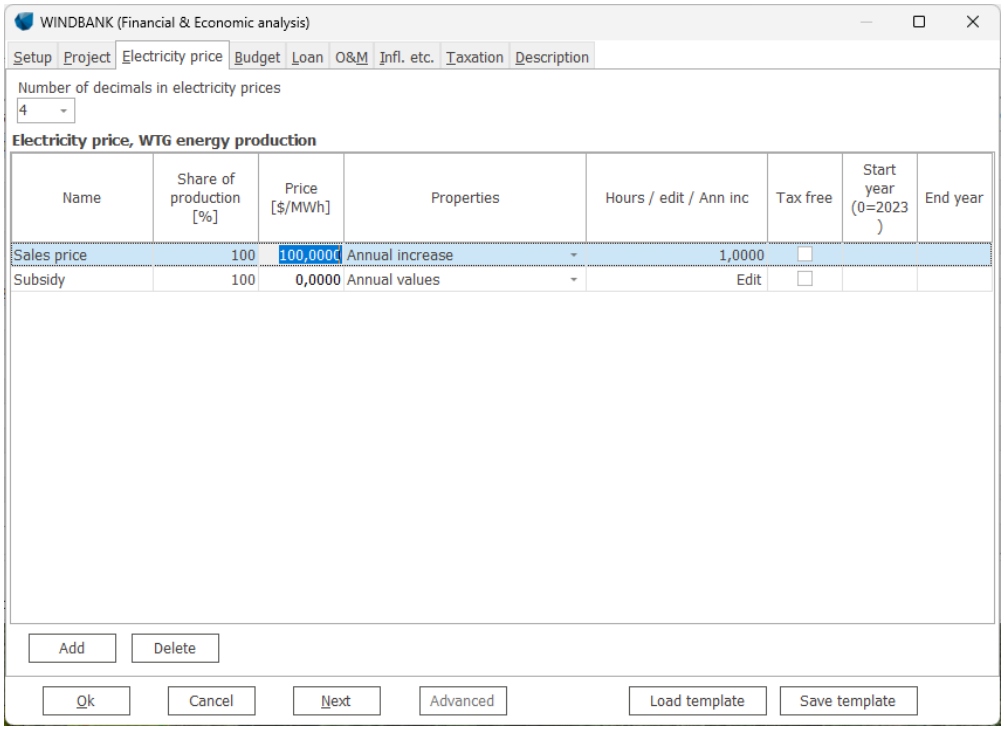
- User defined: All data input are free.
- Use WTG from object list: You get a list box with the names of the WTGs established as objects in the project (if any).
- Use WTG from WindCat: You get a list box with the names of all the WTGs in the WTG Catalog.
- Load from Energy Calculation: You import information from an already performed Energy Calculation into this project.
- Link to Energy Calculation: As the above option, but with an automatic update of the calculation whenever the information in the Energy Calculation is changed.

The field 'Calculated Production - 10%' will often be used to balance the uncertainties of the Energy Calculation. The 10% will often not be sufficient, as the estimated figure depends heavily on the terrain conditions and the available Wind Data. The 10% can be set to other value in the energy calculation and will by "load from energy calculation" be transferred to WINDBANK.

You can choose to perform calculations on "existing WTG", meaning that instead of Expected life span, you are asked to enter Remaining life span. The life span of a turbine project is normally 20 years, while the design basis of turbines typically is 20 years. Although there seem to be a trend in expanding the life span to 25-30y.

Installation date is very important to know how works: If the month 12 is used, AND Ultimo month, the project is assumed installed the 31.12 and thereby there will be tax savings due to depreciation for the year "0" (installation year), but no income or costs – these will be 12 months based for the year 1. If month 1 AND primo month is used, Year 1 will be a full year, and also the first year where tax savings can be seen. If other combinations, the year 1 will not be a full year, the income and costs will be divided to match the number of months the first year.

10.3.3 Electricity Price



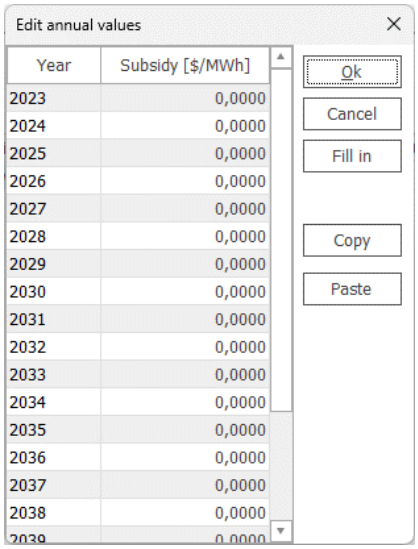
You can construct your own specific profile for the expected kWh price over the life span. If a part of the electricity is used for own consumption and another part is sold, both parts can be given individual pricing profiles.

The options for each input line are:
Name; e.g. Market price or Subsidy etc.
Share of production; If production is sold to different purchasers, or some of the production is used by owner specific prices can be given for specific parts of the production. In most cases there is only one and 100% is used.
Price; remember to input in the right unit as specified in tab “Project”.
Properties, the options are (in combination with the field **Hours…** to the right):

- Input annual increase – input the annual increase percentage in field to the right.
- Inflated – the inflation specified at the “Infl. Etc” tab is used for increasing the annual price.
- Annual values – freely defined annual values, see below.
- Limited by full load hours - input the number of full load hours with the increased price in field to the right.

Tax free; can be checked, if all or part of the income are tax free. E.g. House hold turbines, that produced private consumption, direct into own installation, will typically be tax free income

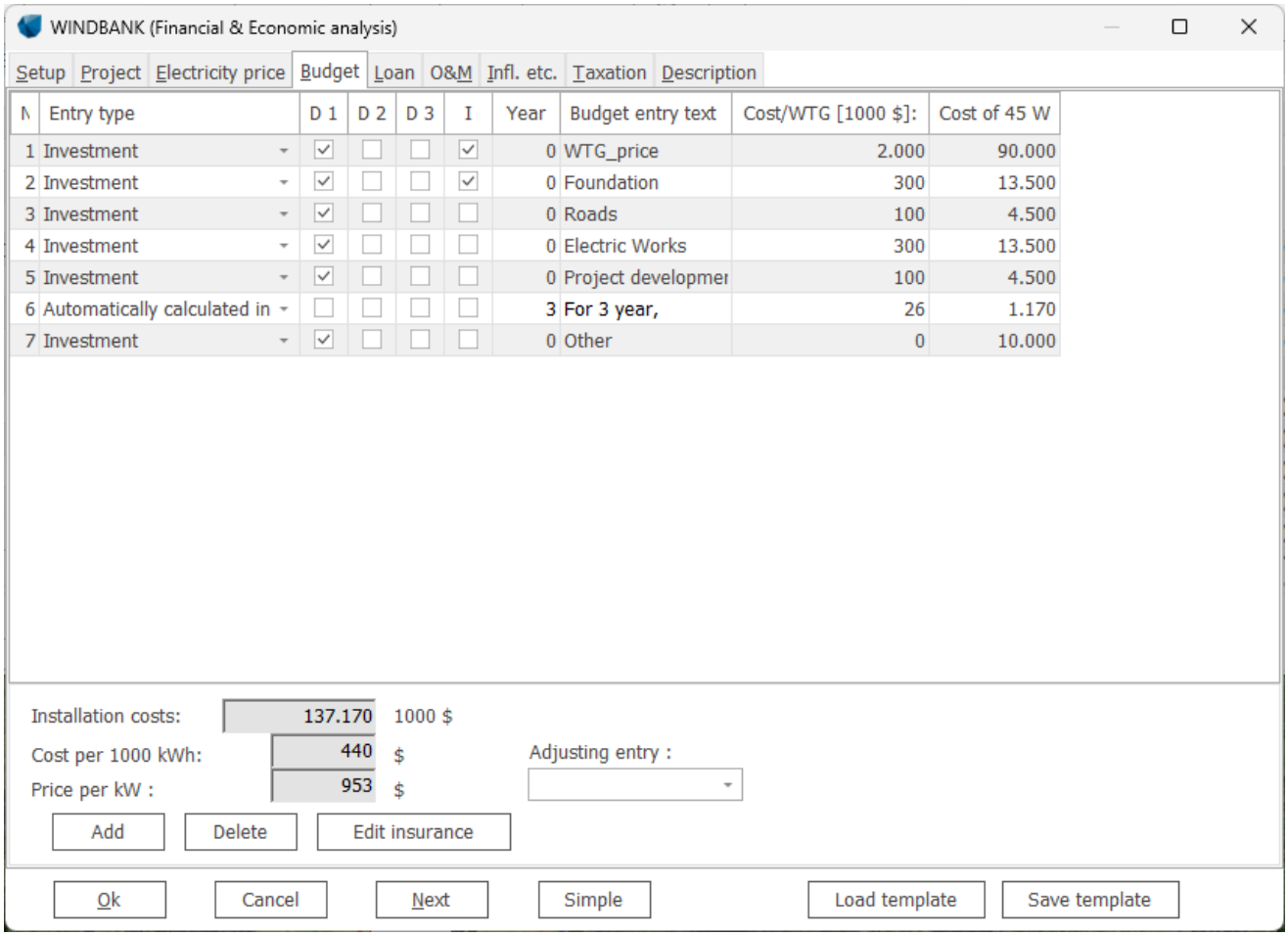
When “Annual values” is chosen, the input form below appears:



Here year by year values can be entered. With the “fill in” button, the current (selected) field value will be filled down to all remaining fields.

To review/edit annual values, just click in the field to the right.

10.3.4 Budget



A simple budget can be entered, or you can activate the “Advanced/Simple” button to get access to a detailed description of each budget line (see the above figure). The following items can be specified:

Entry type:

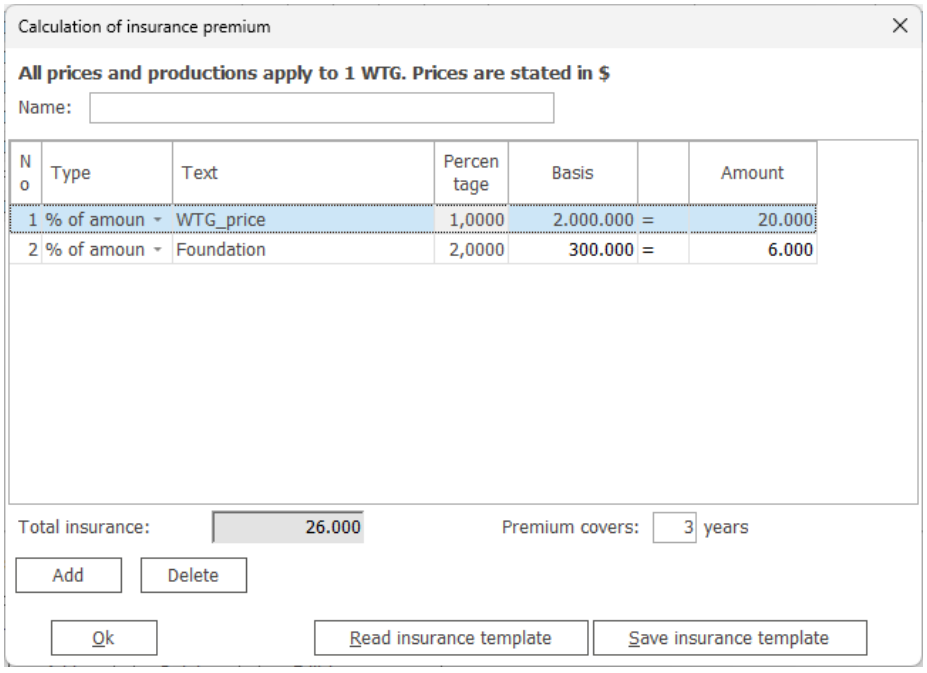
- Investment - normal
- Prepaid O/M - e.g. Service and Insurance for five years (which is included in the budget but treated as O/M costs) – filled in combination with the "**Year**" column!
- Automatically calculated Insurance - An AUTO- Insurance calculator can be loaded (see below).

For each entry type, different properties are available:

- D: Depreciations: 3 different depreciation methods can be chosen. These can be defined at the "taxation" tab, where different percentages etc. can be chosen.
- I: Insurance: - specifies whether or not the component shall appear in the insurance calculator

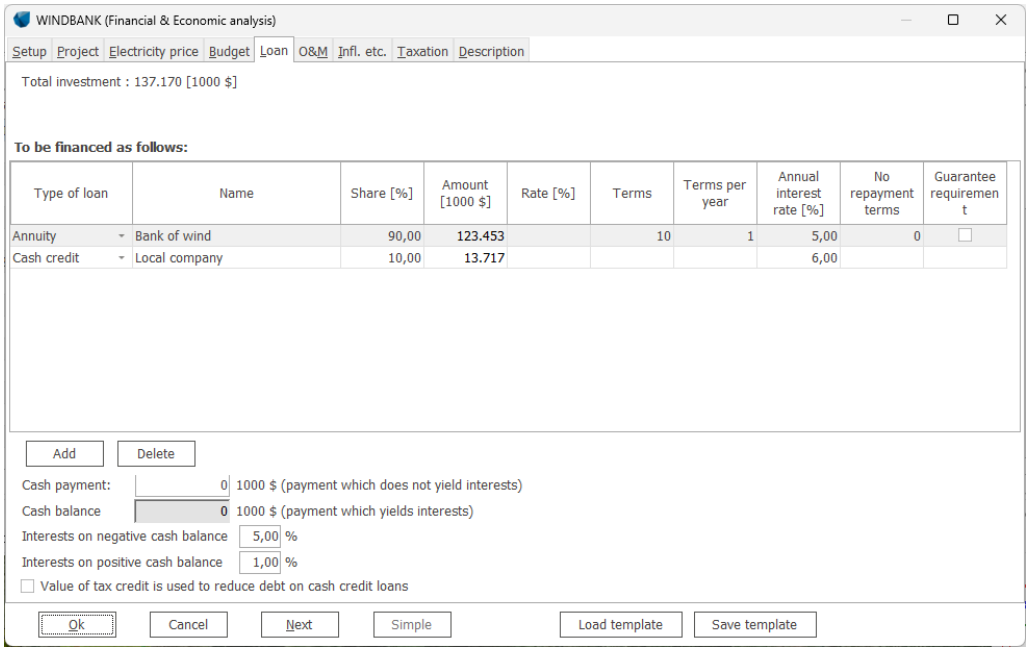
Adjusting Entry: One of the budget components can be chosen as an "adjusting entry" item. This makes it easy to get a nice round figure for the total budget price.

10.3.4.1 Insurance Calculator



Any budget entry marked under "I" under "Advanced" will appear, and can be multiplied with entered multipliers. It is not unusual to calculate insurance amounts in this way.

10.3.5 Loan



For a non-coop project only this type of loan can be selected. For coops project, this loan means that it is taken individual by each coop.

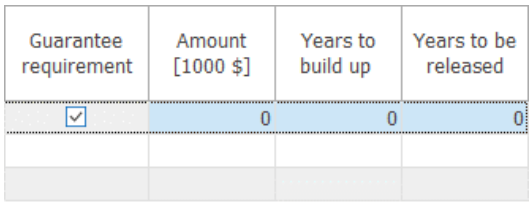
The following types of loan can be selected:

- Annuity (constant annual payment =(repayment + interest))
- Series (constant annual repayment)
- Index series (inflation adjusted principal)
- Cash Credit (repayment will automatically be calculated as the total profit each year).
- Bond loan

Under 'Cash Credit' no Term shall be entered - it will be calculated automatically and 'Terms per year' will automatically be 1.

'Cash Payment' can be calculated with or without an Interest Calculation.

You can enter Interest Rates on as well negative as positive Cash Balances. A Cooperative Cash Balance is always positive or equal to zero.

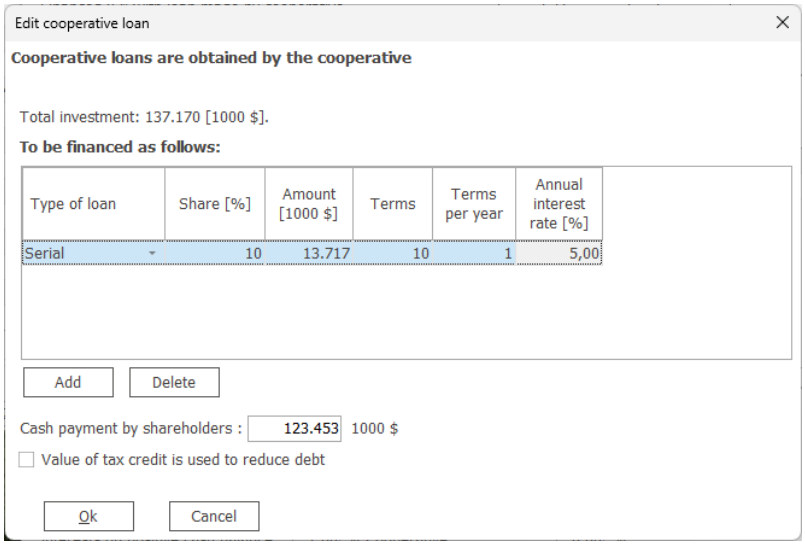


When "Guarantee requirement" are checked, 3 extra columns appear. Here it is possible to specify how an amount can be "held back" some years, and then released. It will sometimes be seen that banks require an extra guarantee handled this way as extra safety for their loan.

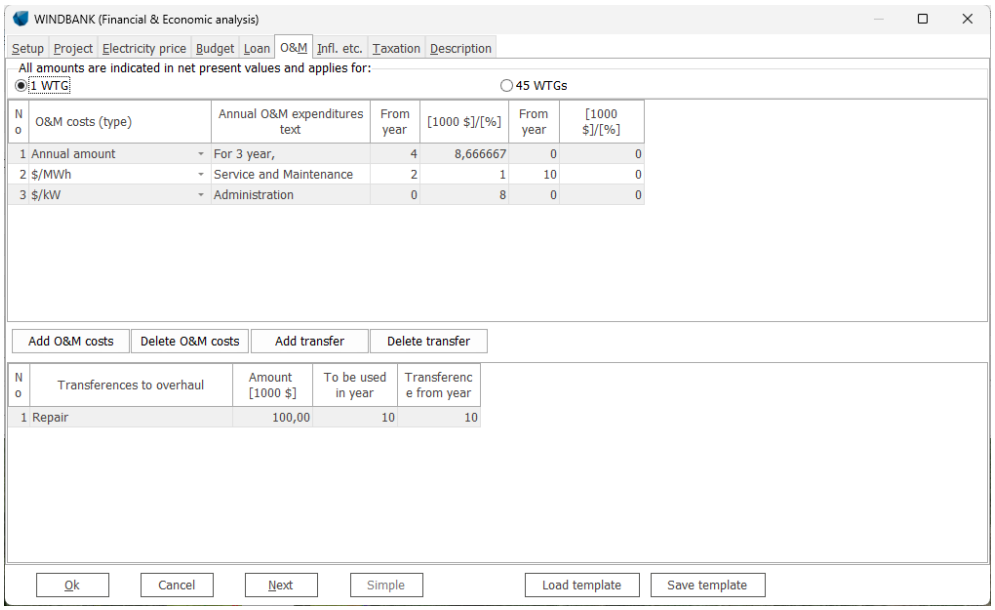
10.3.5.1 Loan by Coops (common loan for coops)

If the project type is a Coop, there can be specified loans granted to the Cooperative as collective loan, and not to the individual member of the Coop.

The input form for the loan follows the structure given previous, see input form below.



10.3.6 O&M (Operation and Maintenance)



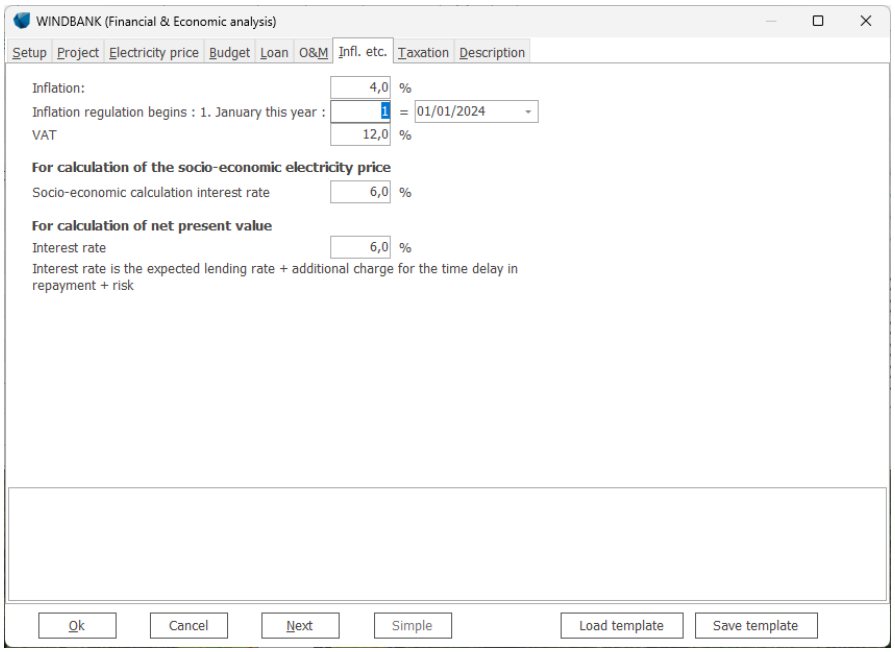
There can be specified 2 periods with different O&M costs.

O&M can be specified as several different components, where each and all of the components can be listed as:

- Annual amount
- % of investment (project costs)
- % of Electricity sale (annual income)
- Costs in specified Currency/kWh - e.g. 0.01 US$ pr. kWh produced electricity
- Costs in specified Currency/kW - as the above item, but pr. installed capacity
- Annual amount, no inflation – as first item, but not inflated

Transferences to overhaul - major investments will have to be expected during the lifetime of the wind turbine - e.g. new gear box or blade repair after 10 years.

10.3.7 Inflation, etc.

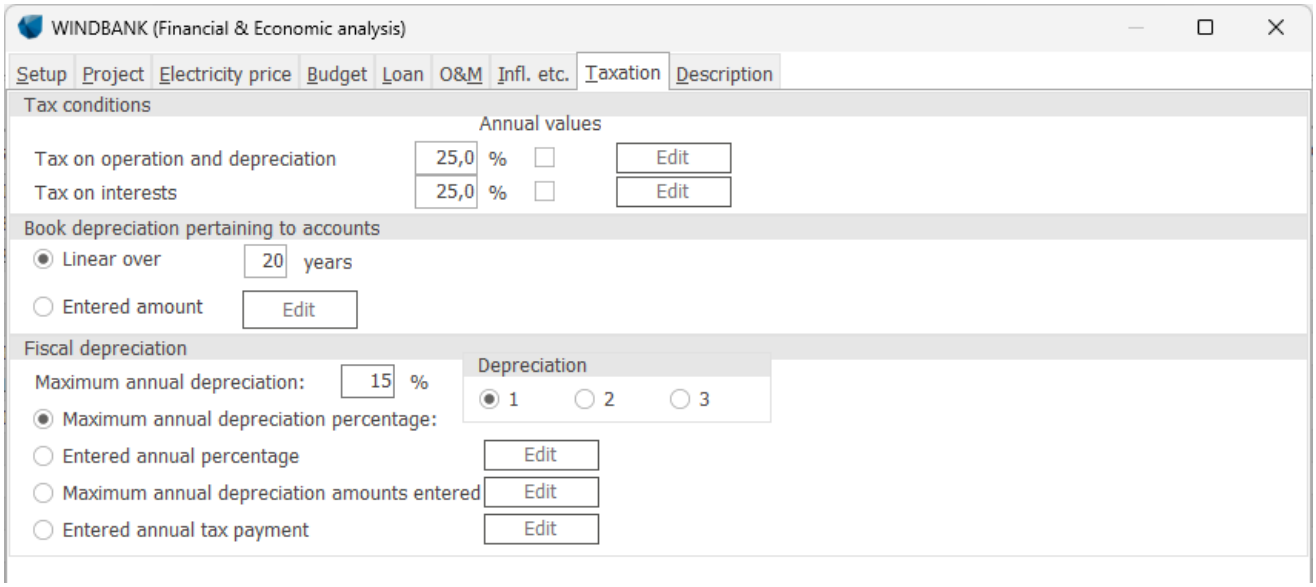


The VAT taxation amount will not affect the results in this version of WINDBANK - all amounts are assumed to be excl. VAT.

For a socio-economic evaluation of project, the price per produced kWh can be calculated. For this a socio-economic calculation interest rate must be used. This is normally given by the government. The value is decided based on a combined evaluation of the interest level and the risk by the type of technology. The Government can, based on the cost/kWh seen in a long-term perspective, tell which technology is cheapest to use for electricity production.

For net present value calculation, similar can be given an interest rate, where it is the investor who decides the interest rate based on expected risk etc.

10.3.8 Taxation



The Tax item can be divided into taxation concerning Operation & Depreciation and Interests. In some countries there will be different ways of treating tax savings on interests and on negative profit – if any.

The item 'Book Depreciations' affects the annual 'balance sheet', which is different from the 'annual liquidity' (cash flow). For the balance sheet, the typical way to handle depreciation is linear over the expected lifetime of the project, telling that the value of the project is decreased with the same amount every year. But regarding tax, it is often allowed to make a faster depreciation. These regulations are made by the governments to give investors an incentive to investments, to make the county develop faster and be more competitive. That's why the "Fiscal Depreciation" can be handled separately, but it might not be useful in all countries.

The item 'Fiscal Depreciation', affects the 'annual liquidity', if the depreciation gives tax savings. The input of the depreciation can be given in several different ways. And there can be defined up to three different sets, which link to the budget lines, where one of the three different sets can be chosen. For the different ways to input, the first two will always work, while the last two only work in combination with the loan type "Cash credit". This work so the repayment on cash credits is adjusted in combination with the depreciation amount, so the fist years always will give a liquidity of zero. In other words, the project is handled so the repayment is as fast as possible, based on the project profit including tax savings due to depreciation. The four different depreciation input methods:

1. Maximum percentage: Each year the fiscal depreciation amounts to a given percentage of the project value, which is not written off in the balance sheet.
2. Entered annual percentage - the annual depreciation percentage can be entered separately for each year by using the 'Edit' bitmap button.
3. Maximum annual depreciation amount - gives you the possibility of letting the software calculate the annual percentage for depreciation based on the investors' capabilities of exploiting the tax allowances.
4. Entered annual income tax payment - as the above item, but where the software calculates the depreciation percentage from the tax allowances and income tax percentage.

Which methods and percentages that can be used depends on the local tax regulations, please confirm with an auditor.

10.3.9 Description

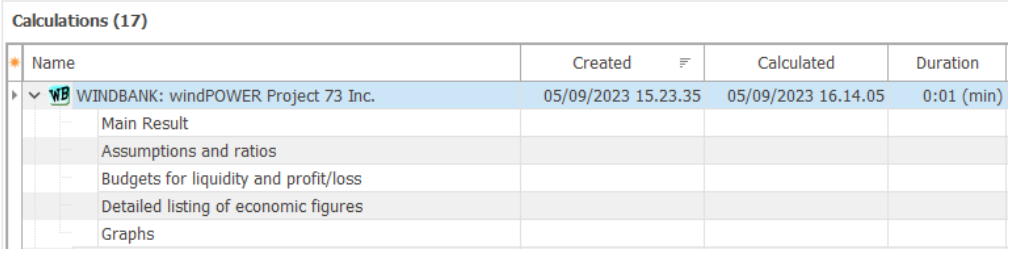
Any comments can be entered and will appear on each printed report page.

10.4 WINDBANK – Calculation and printouts

10.4.1 Starting calculation

When you activate the button ‘OK’ in right part of the input forms, the calculation will start automatically.

After the calculation has been completed the following reports will appear:
Below as well an example of coop's owned as private/company owned WTG project are shown. The Coop's calculation produces 2 more reports than the private/company owned.



The Printouts can be activated for preview purposes by double clicking on the report name. You can also mark a report and click on the printer symbol. For a printout of all the reports, right-click on the main heading.

10.4.2 Printouts

The printouts are divided into 5 different report types:

- Main result, with main figures (budget, financing and result).
- Assumptions and Ratios, with more detailed assumptions and some key figures.
- Budgets for liquidity and profit/loss estimates. Time Series with main figures (Cash Flow).
- Detailed financial statement for the "project" - with Time Series of all the calculated values.
- Graphs - graphic presentation of most of the important time series.

For Coop's 2 more printouts will appear:

- Detailed financial statement for the Cooperative including how the economy for the Cooperative will interact with the Coop Members.
- Detailed financial statement for the individual Coop Member (the interested party)

The printouts should be fairly self-explanatory - if not, don’t hesitate to call at EMD.

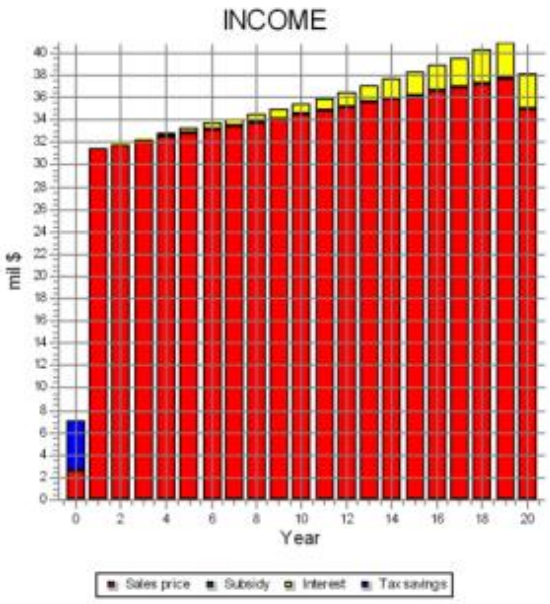
Project:
Aparados da Serra basic project

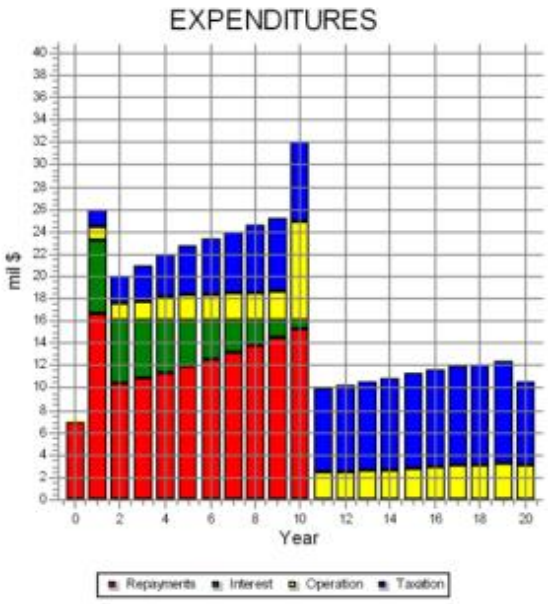
Description:
This project was generously provided by VILCO Engenharia e Consultoria Ltda.
Data has been distorted to protect the source and does not reflect reality.

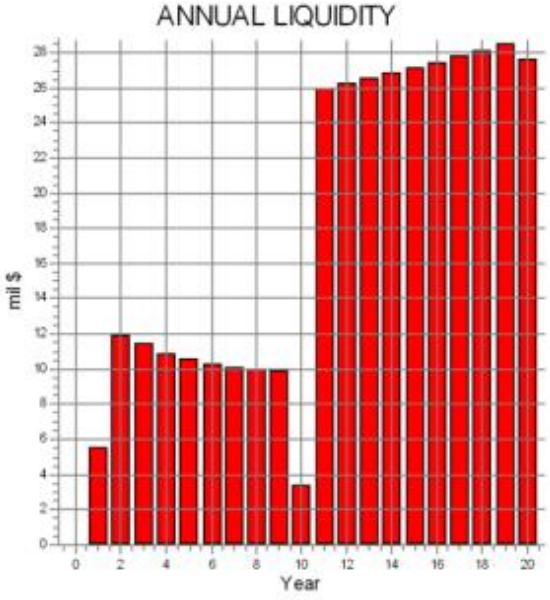
Licensed user:
EMD International A/S
Niels Jernes Vej 10
- -
+45 6916 4850
pmn / pmn@emd.dk
Calculated:
05/09/2023 16.18/4.0.418

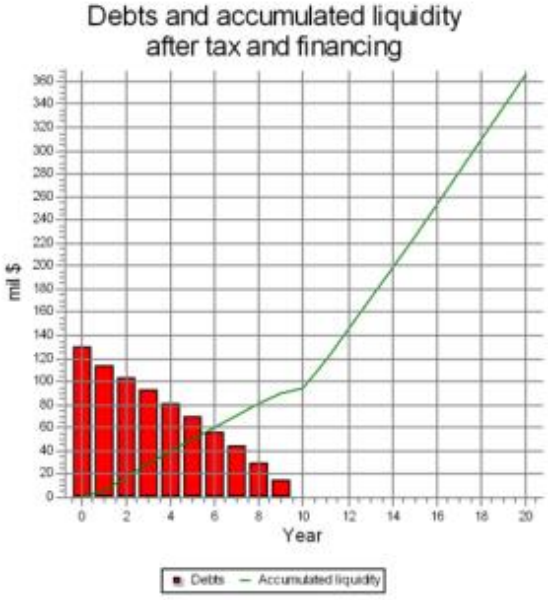
WINDBANK - Graphs

Calculation: windPOWER Project 73 Inc.









Example of printout page. The graphs illustrate the cash flow.