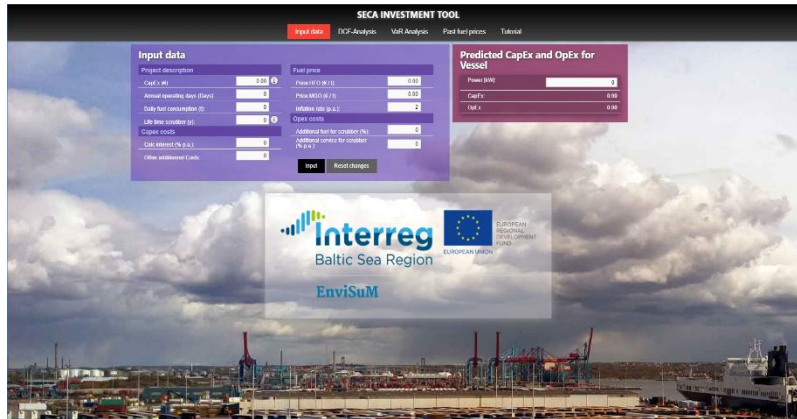


Introduction

The SECA Investment Tool presents two structural analysis: the **dynamic approach** (left-hand side) and the **static approach** (right-hand side), presented respectively in the left-hand side table and the right-hand side table of the official tool's page as shown in the following screenshot:



The dynamic and the static analysis approaches are powered based on whether the fuel prices (HFO versus MGO) are considered dynamic (i.e. high prices' volatility) or constant (i.e. static with insignificant volatility of prices) over the investment lifespan.

Based on the imputed predefined OpEx and CapEx models, the static analysis approach (right-hand side) gives the manager, the possibility to assess and predict the magnitude of the operating and capital expenditures related to the investment, as far as the power of the engine is predefined.

However, to have a state-of-art identification method, the tool will support only the dynamic approach (left-hand side), as it is the most realistic approach. The user can always predict OpEx and CapEx by the static approach and then switch the dynamic analysis method to continue the calculations.

Tool Presentation

The tool is organised in four windows: Input data; DCF Analysis; VaR Analysis and Fuel prices.

1) Input data: In this first window, the user needs to list all the key input variables required to start the financial evaluation of the project. The tool displays the required data in four levels/blocks of inputs: (i) the project characteristics (ii) the financial data (iii) the fuel prices and (iv) the operational data. Once these variables are inputted (in the corresponding boxes), the user need to validate the data by clicking the button '**Input**' to pass to the next steps. Below is a screenshot of the input data window:

2) DCF Analysis: The second window process and present the results of the Discounted Cash Flow analysis. The DCF method is a plausible and robust approach to quantify the complex and large-scale investment in single parameters and gives the decision maker the clues to take the appropriate decision.

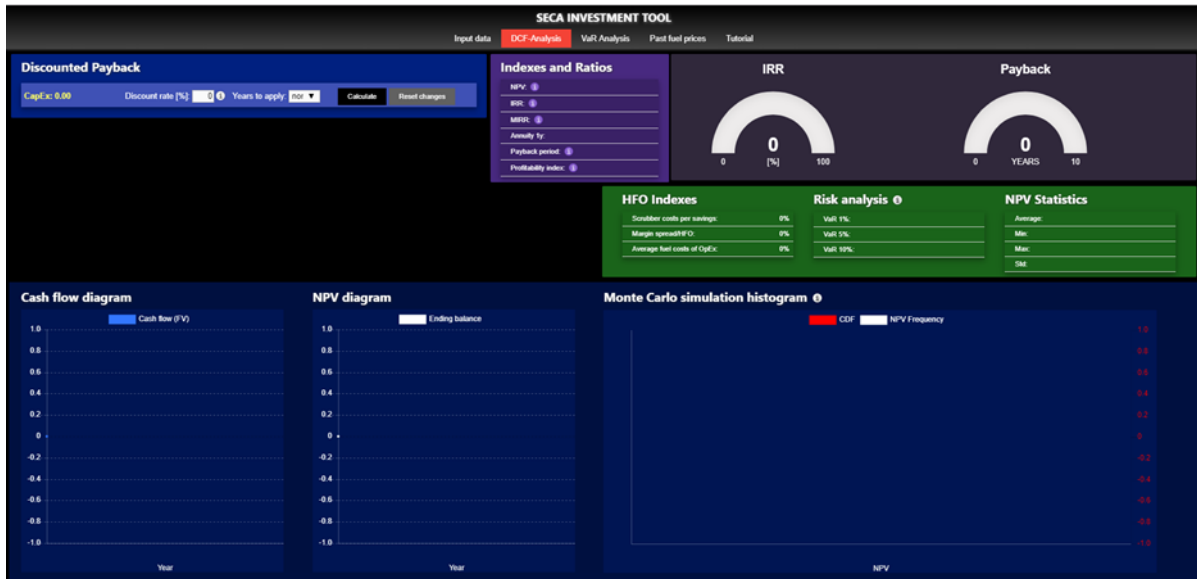
In this phase, the user will be asked to defined the '**Discount Rate**' and the period '**Year to apply**' of interest before launching the calculation process automatically. In this same window, the results provide for the decision maker the main conventional investment evaluation indicators and indexes: NPV, IRR, MIRR, Payback period and so on. These statistics are presented in four tables:

- Discounted Payback (cash-flows, the **blue tale**)
- Indexes and Ratios (the **purple table**)
- HFO Indexes, Risk analysis and NPV Statistics (the **green table**)

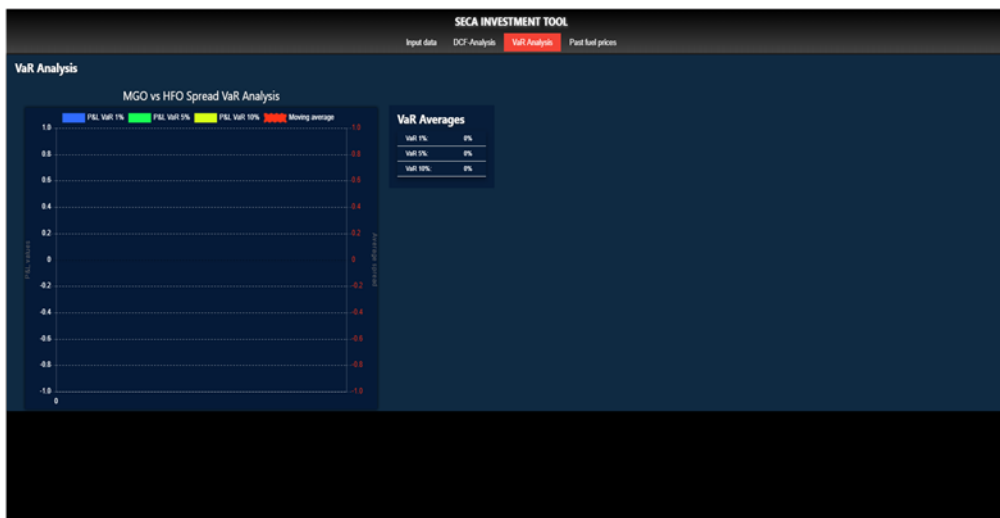
Besides these statistics, the tool offers four diagrams that display the results graphically and develop risky scenarios:

- IRR and Payback
- Cash flow diagram
- NPV diagram
- Monte Carlo simulation histogram that quantifies risk and uncertainty associated with the feasibility of the investment

Definitions of all variables are presented in the tool to help the user to understand and analyse the results quickly. The following screenshot shows all these aspects of this second window:



3) VaR analysis: In this window, the user will have more insights about the *Risk analysis*. Concerning the fuel prices, the tool displays graphically the results of the primary risk indicator used in the industry (i.e. the parametric Value-at-Risk–VaR). The tool uses MGO versus HFO spread prices to estimate the Profit and loss (P&L) derived from the VaR risk analysis. Three different VaR specifications are used: VaR at percentile 1% level; VaR at percentile 5% level and VaR at percentile 10% level. The user has to define the period of interest. Below, a screenshot of this window:



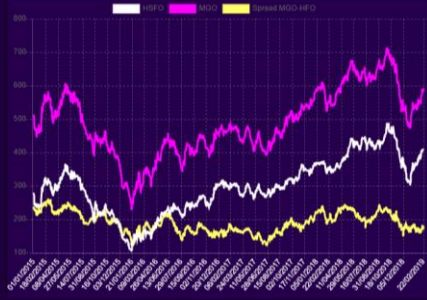
4) Fuel prices. The window presents historical bunker fuel prices. It gives the user the possibility to compare and combine the variations of different fuels. Similarly, the user needs to define the period of interest. The available data starts from 01 January 2015.

Overview of past fuel prices

From 2015-01-01 to 2019-02-22

Update

Past fuel prices



Practical case

In what follows, the user will find the application of the tool to a maritime investment project. The study addresses an investment project of scrubber abatement and its evaluation. Possible results are illustrated in the following screenshots:

The screenshot displays the 'SECA INVESTMENT TOOL' interface. It features a navigation bar with 'Input data', 'DCF-Analysis', 'VaR Analysis', 'Past fuel prices', and 'Tutorial'. The 'Input data' section is highlighted in purple and contains the following fields:

- Project description: CapEx (€) 5 680 000.00, Annual operating days (Days) 300, Daily fuel consumption (t) 60, Life time scrubber (y) 15, Capex costs, Calc. interest (% p.a.) 6, Other additional Costs: 0.
- Fuel price: Price HFO (€/t) 335.00, Price MGO (€/t) 569.00, Inflation rate (p.a.) 2.
- Opex costs: Additional fuel for scrubber (%) 10, Additional service for scrubber (% p.a.) 2.

The 'Predicted CapEx and OpEx for Vessel' section shows:

- Power (kW): 0
- CapEx: 2 990 000.00
- OpEx: 31 450.00

At the bottom, there is a logo for 'Interreg Baltic Sea Region' and 'EnviSuM', along with the 'EUROPEAN REGIONAL DEVELOPMENT FUND' and 'EUROPEAN UNION' logos. The background image shows a shipyard with a large vessel under construction.

The screenshot displays the 'SECA INVESTMENT TOOL' interface with various analysis results. The 'Discounted Payback' section shows a table with columns for 'Year', 'Annual agreed saving', 'Annual operation Costs', 'Cash Flow', 'Beginning Balance', 'Net Cash Flows (Discounted)', and 'Ending Balance'. The 'Indexes and Ratios' section displays:

- NPV: 10 388 261.76
- IRR: 36%
- Payback: 2 YEARS

The 'HFO Indexes' section shows:

- Scrubber costs per savings: 30%
- Waste spent/HFO: 70%
- Average fuel costs of OpEx: 42%

The 'Risk analysis' section shows:

- Left 1%: 4 075 776.00
- Left 5%: 6 809 271.32
- Left 10%: 8 807 508.80
- Left 20%: 10 388 261.76
- Left 30%: 11 969 014.72
- Left 40%: 13 549 767.68
- Left 50%: 15 130 520.64
- Left 60%: 16 711 273.60
- Left 70%: 18 292 026.56
- Left 80%: 19 872 779.52
- Left 90%: 21 453 532.48
- Left 95%: 23 034 285.44
- Left 98%: 24 615 038.40
- Left 99%: 26 195 791.36
- Left 99.5%: 27 776 544.32
- Left 99.9%: 29 357 297.28
- Left 100%: 30 938 050.24

The 'NPV Statistics' section shows:

- Average: 10 388 261.76
- Min: 2 990 000.00
- Max: 30 938 050.24
- Std: 6 976 050.00

The 'Cash flow diagram' shows a line graph of Cash flow (€) over 15 years. The 'NPV diagram' shows a line graph of NPV (€) over 15 years. The 'Monte Carlo simulation histogram' shows a distribution of NPV values with a red curve representing the CDF and a white curve representing the NPV frequency.

