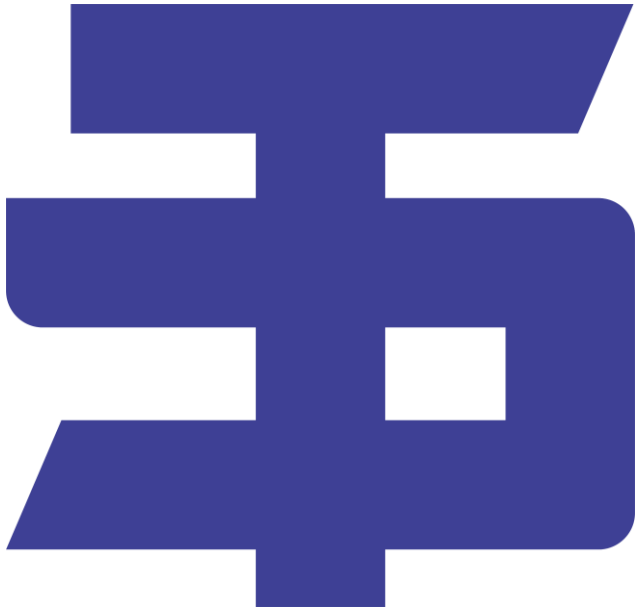


User Tutorial - Mastering SiisolTEA

Techno-Economic Assessment of Green Hydrogen Production

Explore the evaluation of green hydrogen production using solar, wind, or hybrid energy systems, focusing on both technological and economic aspects.

Detailed Sensitivity Analysis

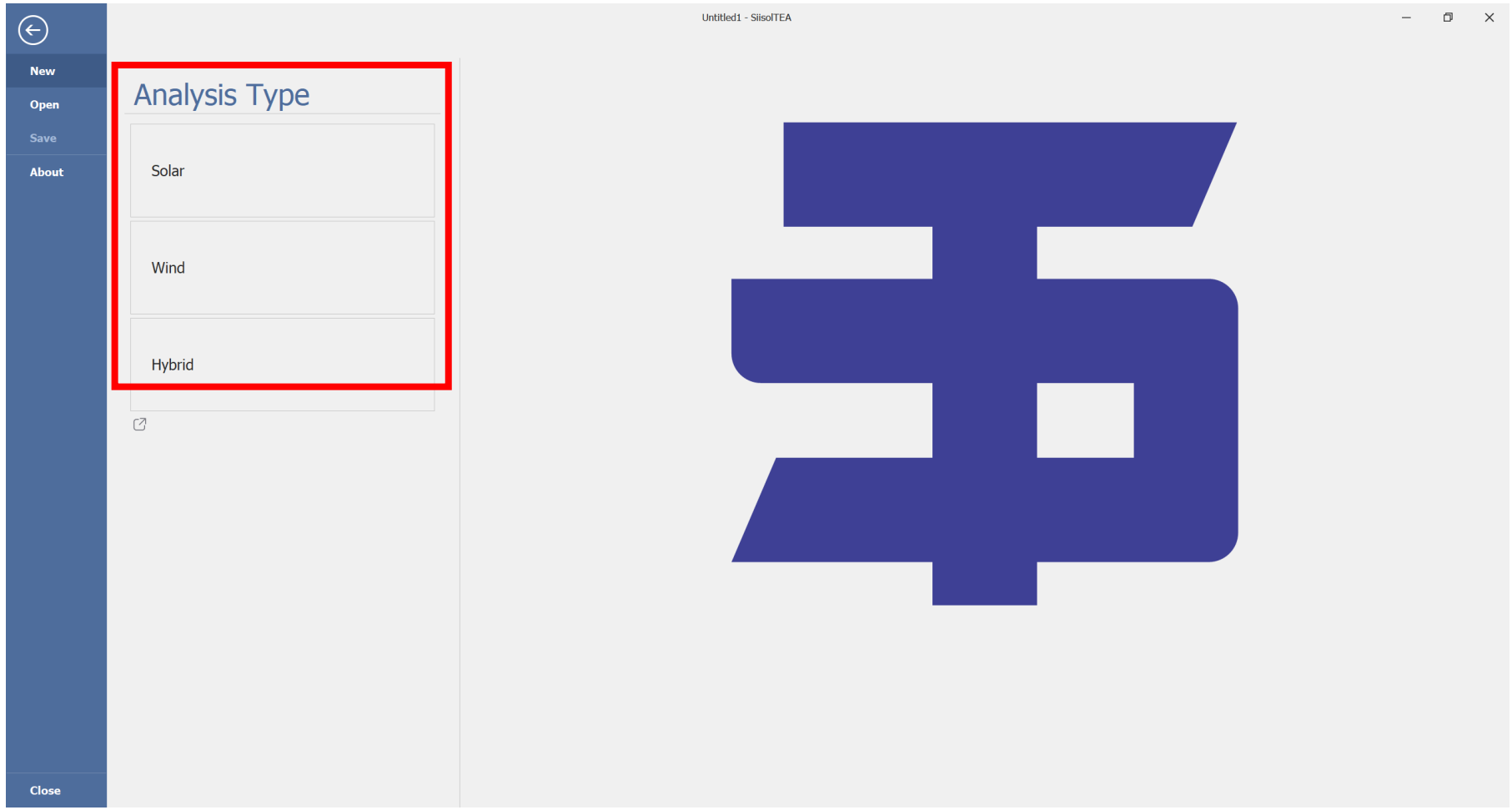
Gain an understanding of how various parameters influence system performance, costs, and viability through comprehensive sensitivity studies.

System Insights and Optimization

Access detailed insights into the integration of renewable resources for hydrogen production and optimize strategies for improved efficiency and cost-effectiveness.

SUSTAINABLE, INTELLIGENT & INTEGRATED SOLUTIONS

After launching SiisolTEA, you will be prompted to choose the type of analysis according to the renewable energy system you wish to evaluate.



Key

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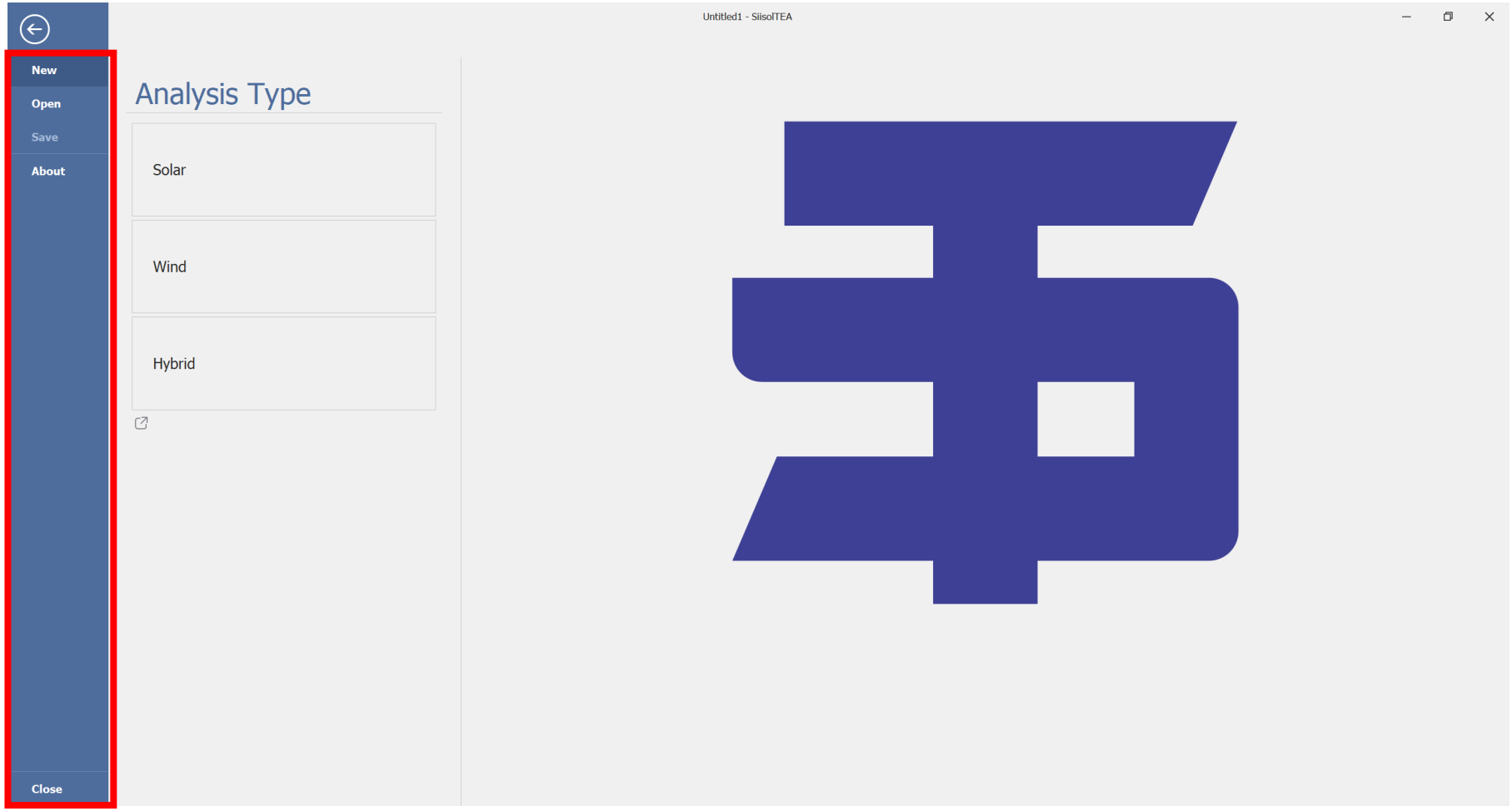
The user can utilize the buttons on the left panel to perform general functions like opening a new window, accessing a saved analysis, saving an ongoing analysis, viewing licensing details, or closing the active window.



Key

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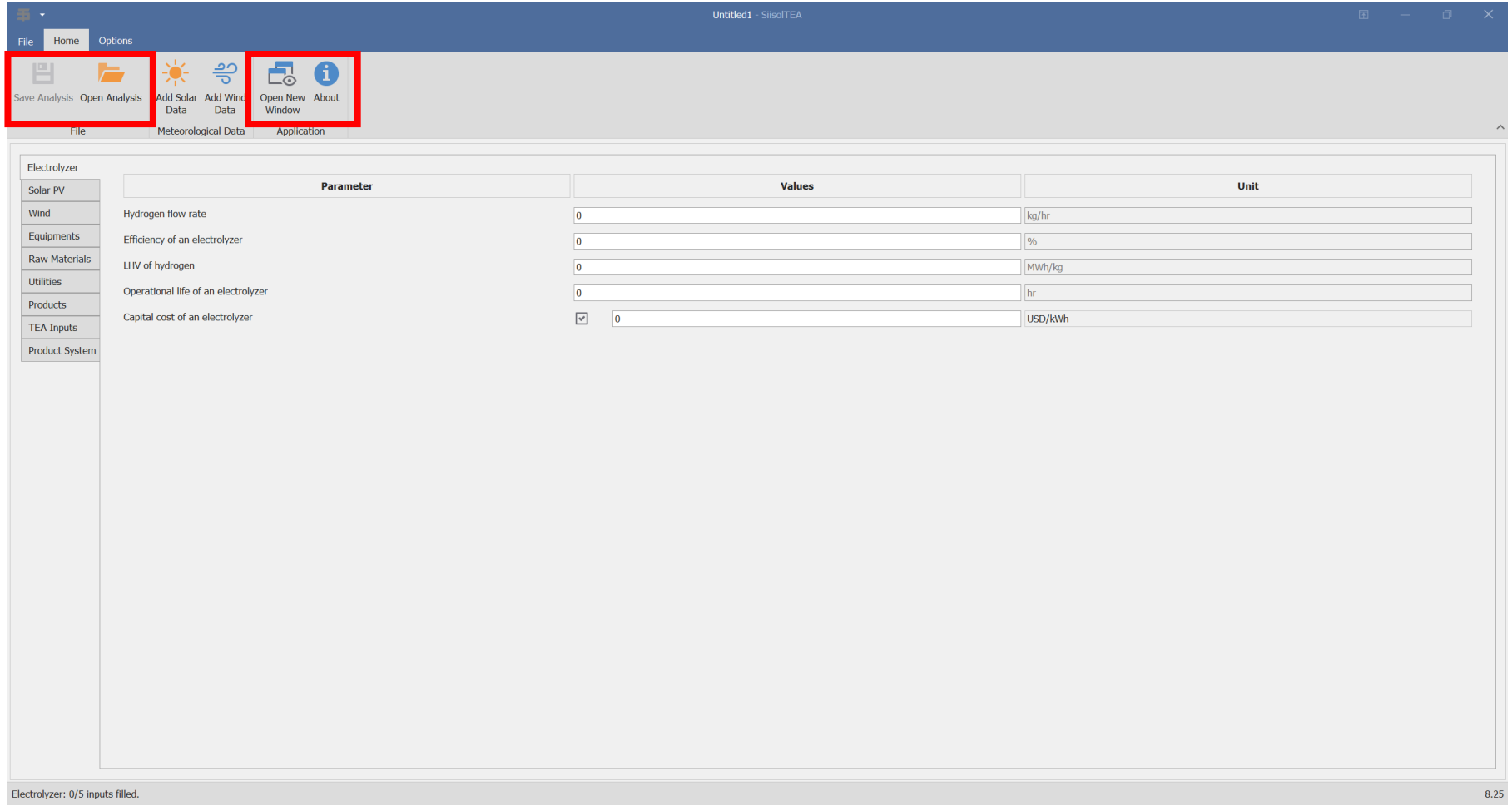
Users can utilize the highlighted buttons on the ribbon to access common functions like saving the current analysis, opening a previously saved analysis, launching a new window, and viewing licensing details.



Key

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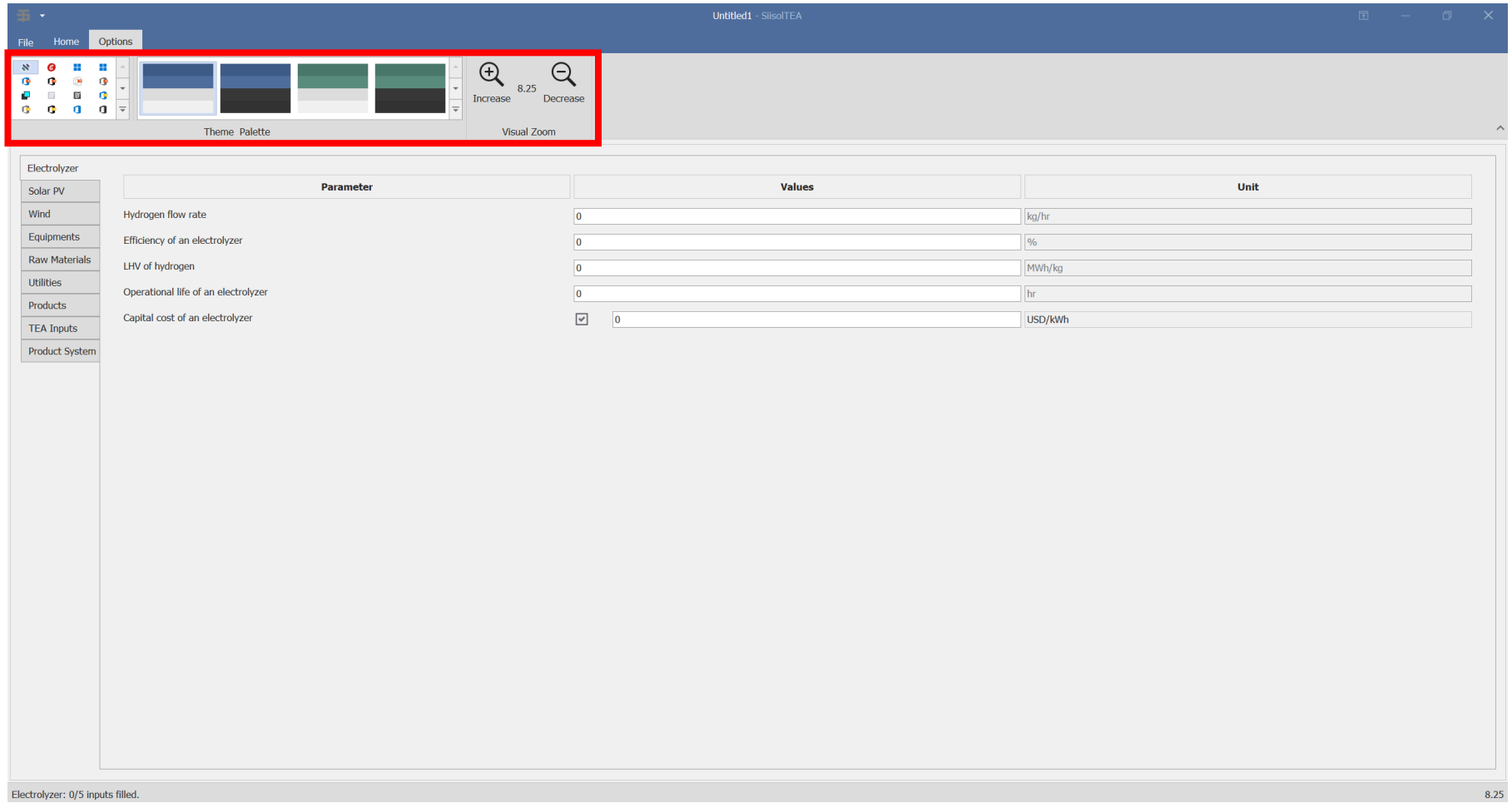
Users can utilize the Options ribbon to modify the application's appearance, such as adjusting the theme, color scheme, and font size of the user interface.



Key

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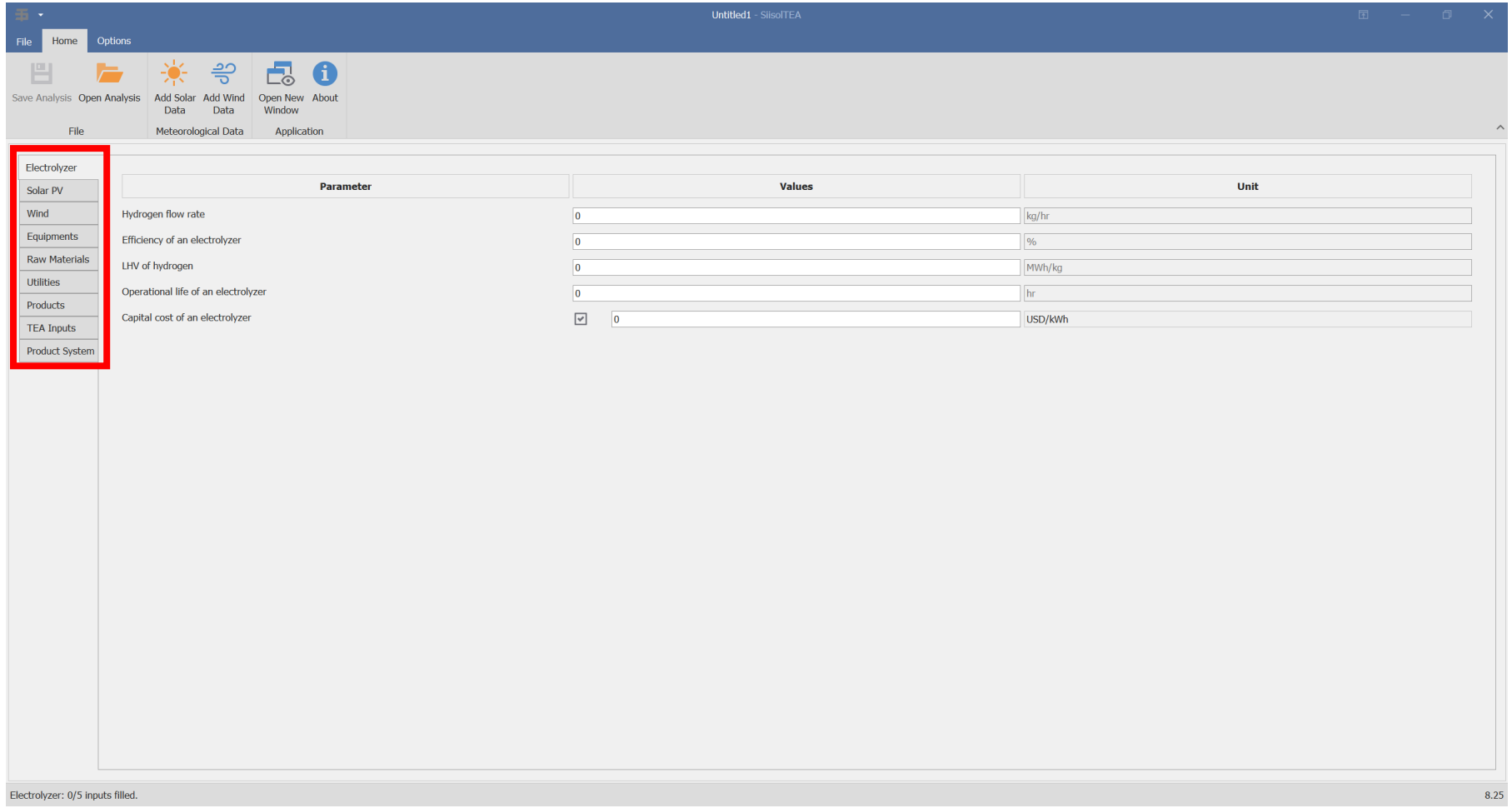
The user will navigate sequentially through the tabs on the left panel to provide all necessary inputs in their respective units for the analysis.



Key

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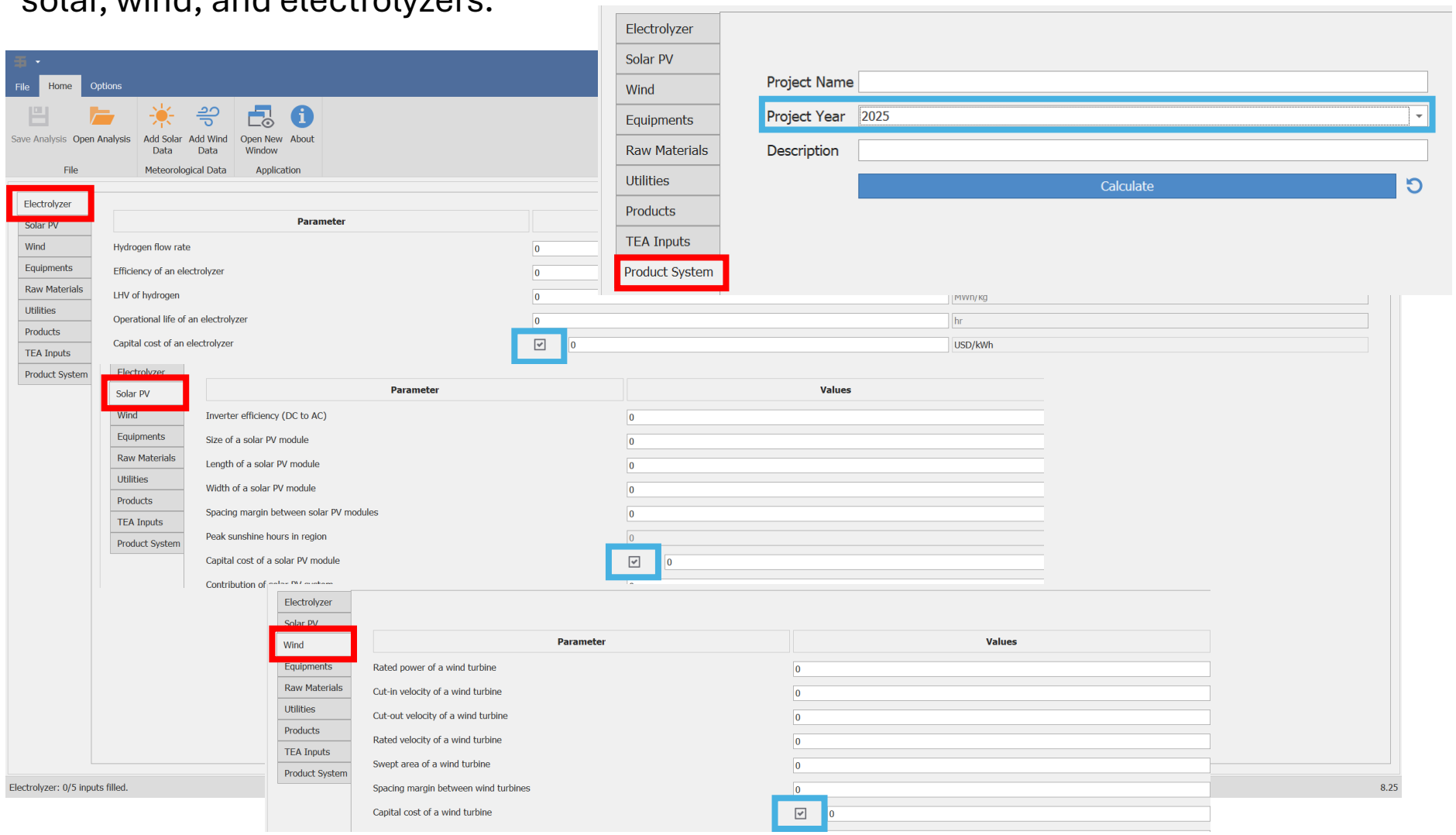
SiisolTEA includes an integrated database containing renewable energy and AWE electrolyzer cost projections for the years 2025 to 2050, based on data from IEA and IRENA. To utilize this feature, please deselect the boxes next to the capital costs for solar, wind, and electrolyzers.



Key

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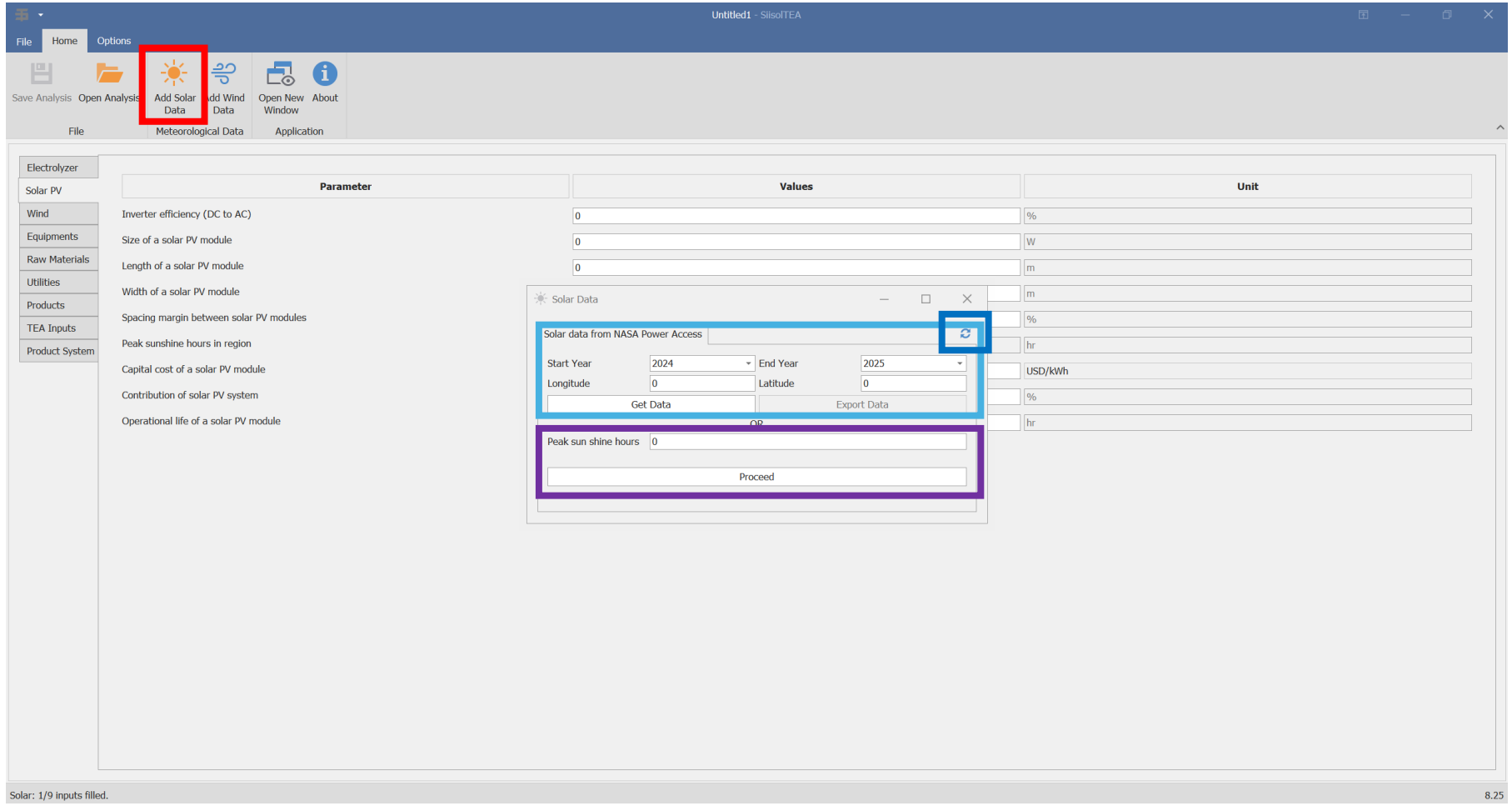
Users must supply solar meteorological data when evaluating solar-based infrastructure. This data can be obtained and exported directly through the built-in NASA Power Access feature or entered manually. Additionally, users can reset the input fields at any time by clicking the reset button located in the top right corner of the Solar Data pop-up.



Key

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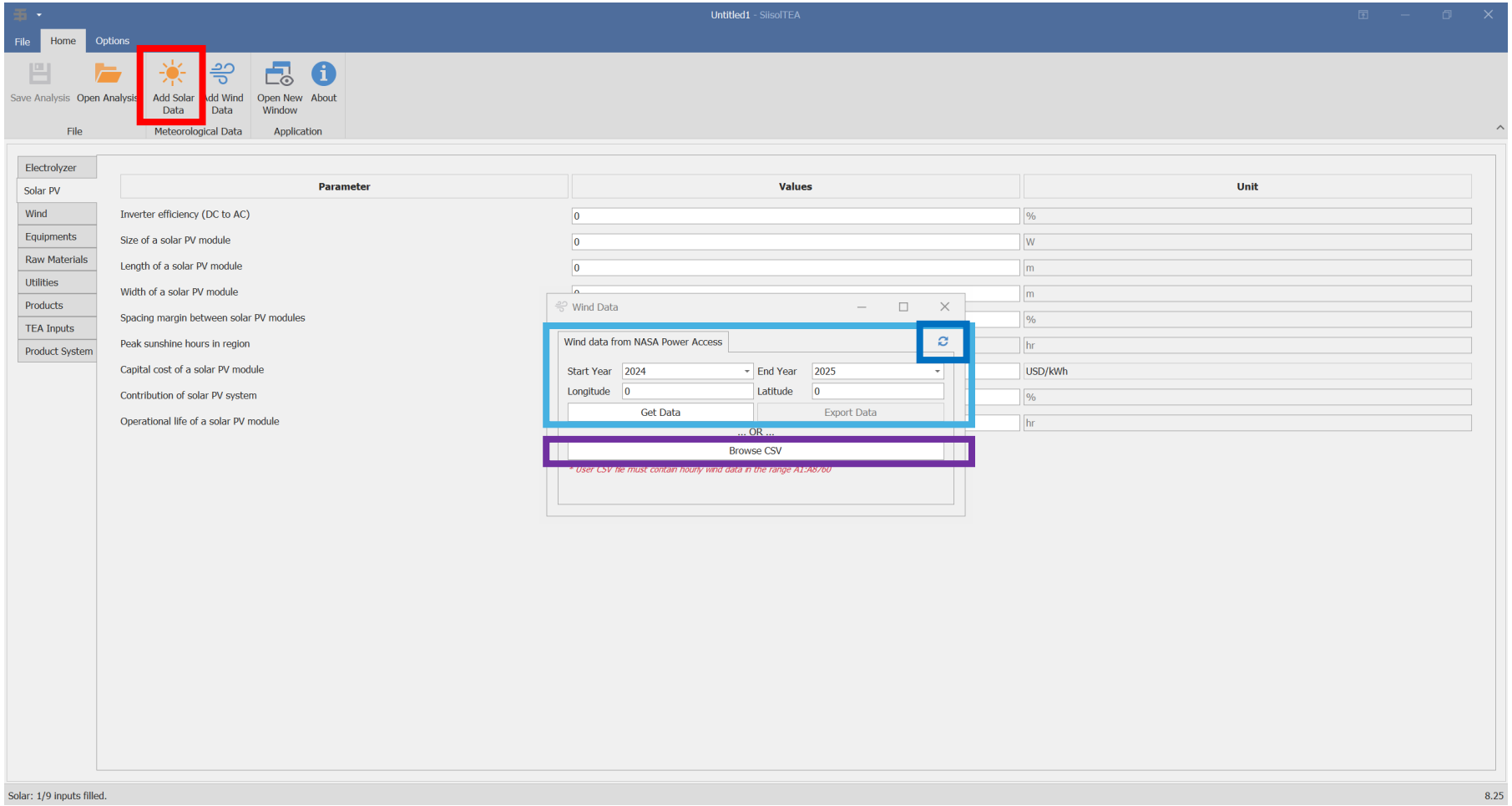
When analyzing wind-based infrastructure, users must supply wind meteorological data. This data can be obtained and exported directly through the built-in NASA Power Access feature or entered manually. Additionally, users can reset the data at any time by clicking the reset button located in the top right corner of the Wind Data pop-up.



Key

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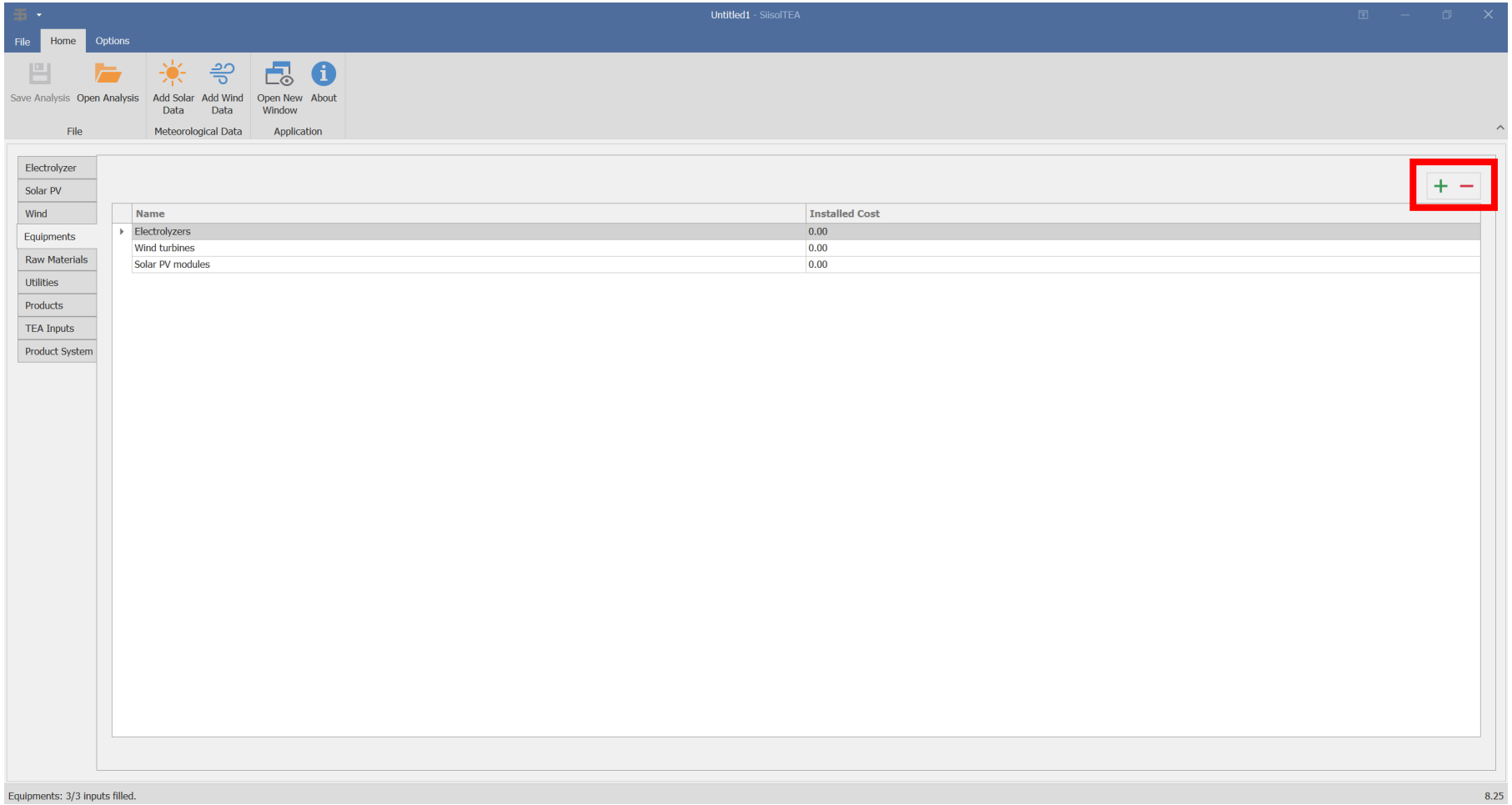
SiisolTEA includes default entries for the equipment needed for the analysis, with no cost inputs required for these items. However, users have the option to add or remove equipment using the + and – buttons in the top right corner. Any equipment added by the user will require associated cost inputs.



Key

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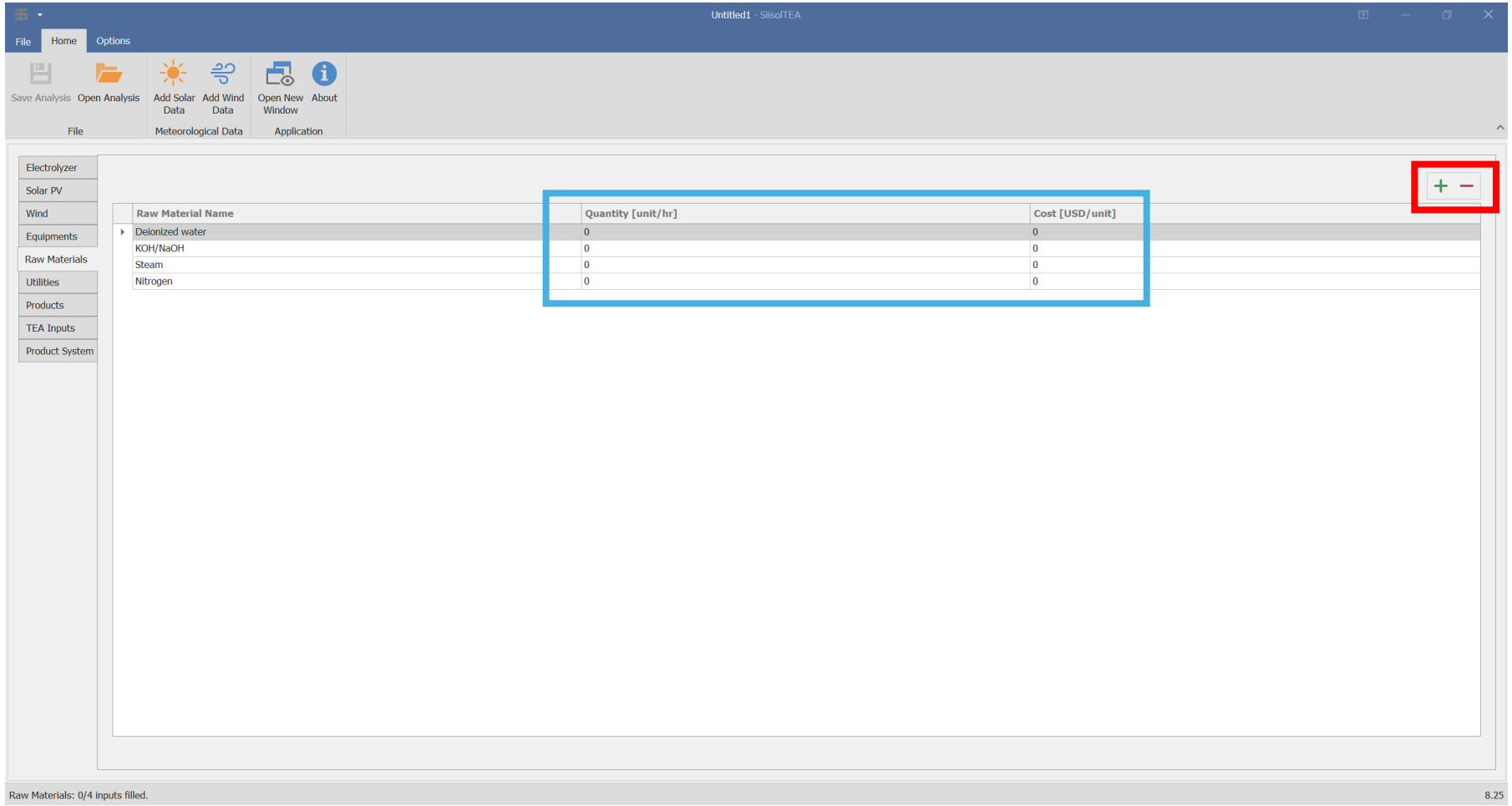
SiisolTEA initially includes entries for the raw materials needed for the analysis. However, users have the option to add or remove items as necessary by using the + and - buttons located in the top right corner. All quantity and cost fields must be completed.



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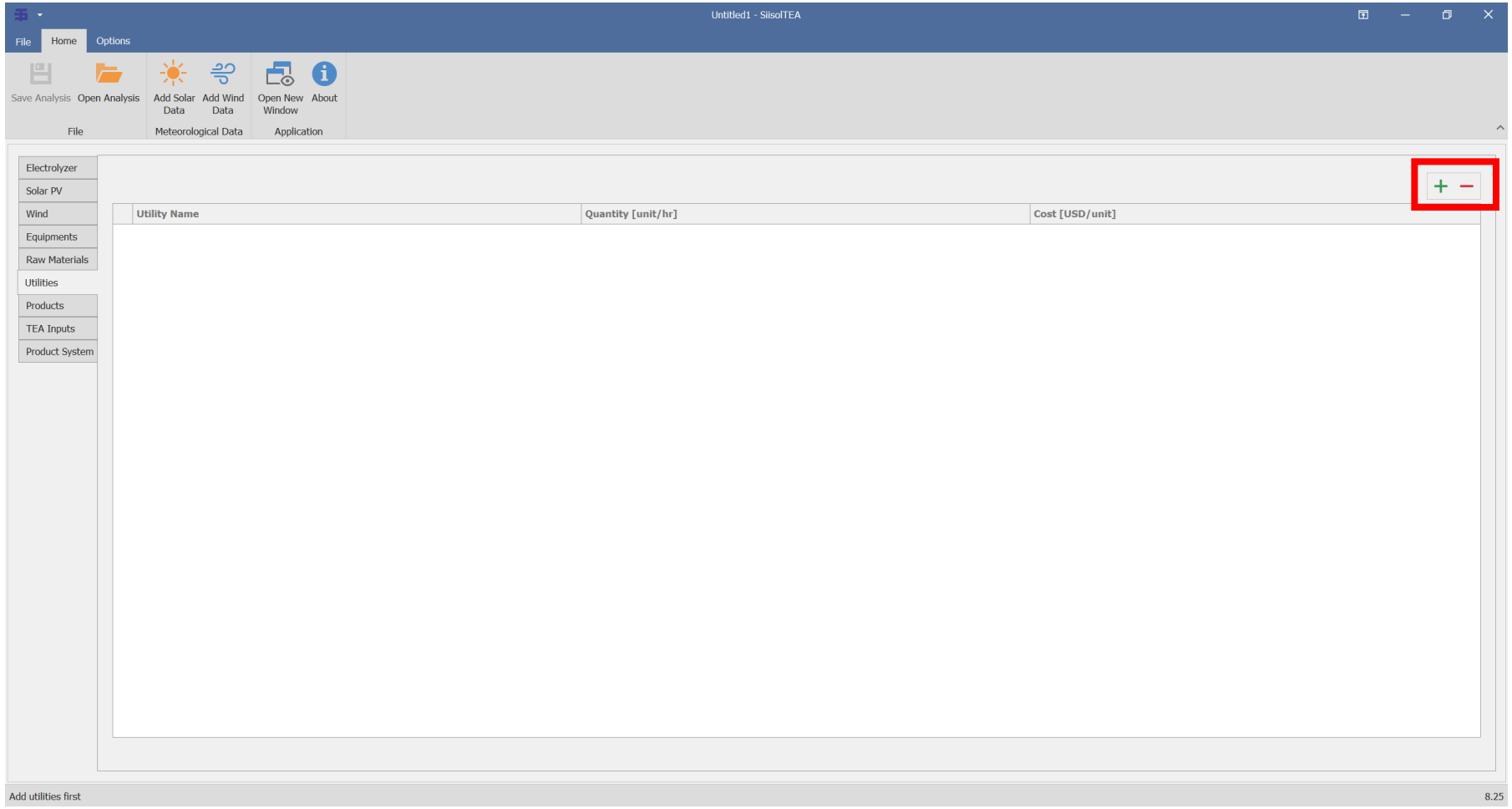
Like raw materials, users can add or remove utilities as needed by using the + and - buttons located in the top right corner. All quantity and cost fields must be filled in.



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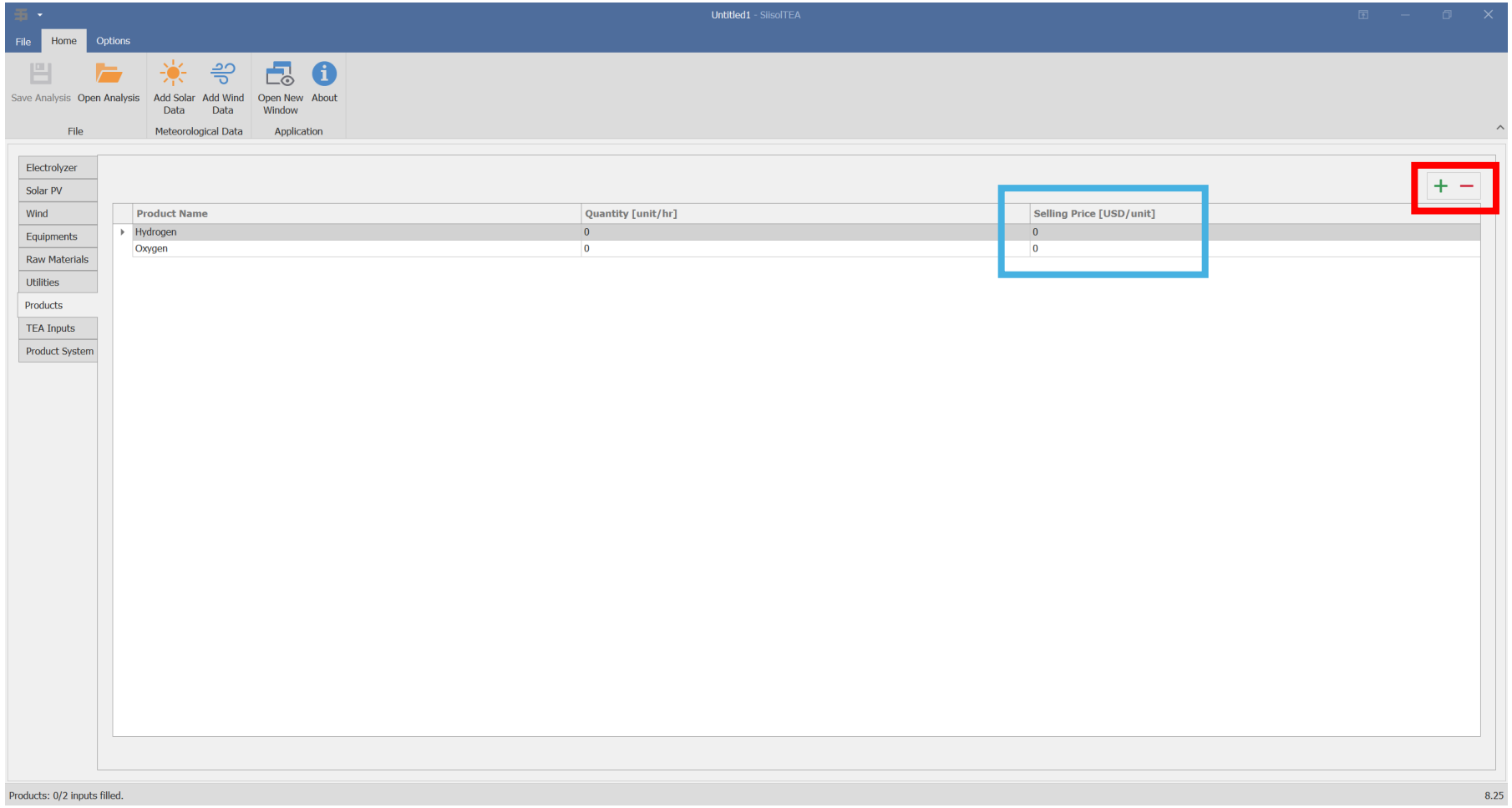
SiisolTEA includes default entries for the products obtained for the analysis. Users have the option to add or remove items as necessary using the + and - buttons located in the top right corner. The software calculates the quantities of hydrogen and oxygen based on the previously defined hydrogen demand, requiring only cost inputs for these products.



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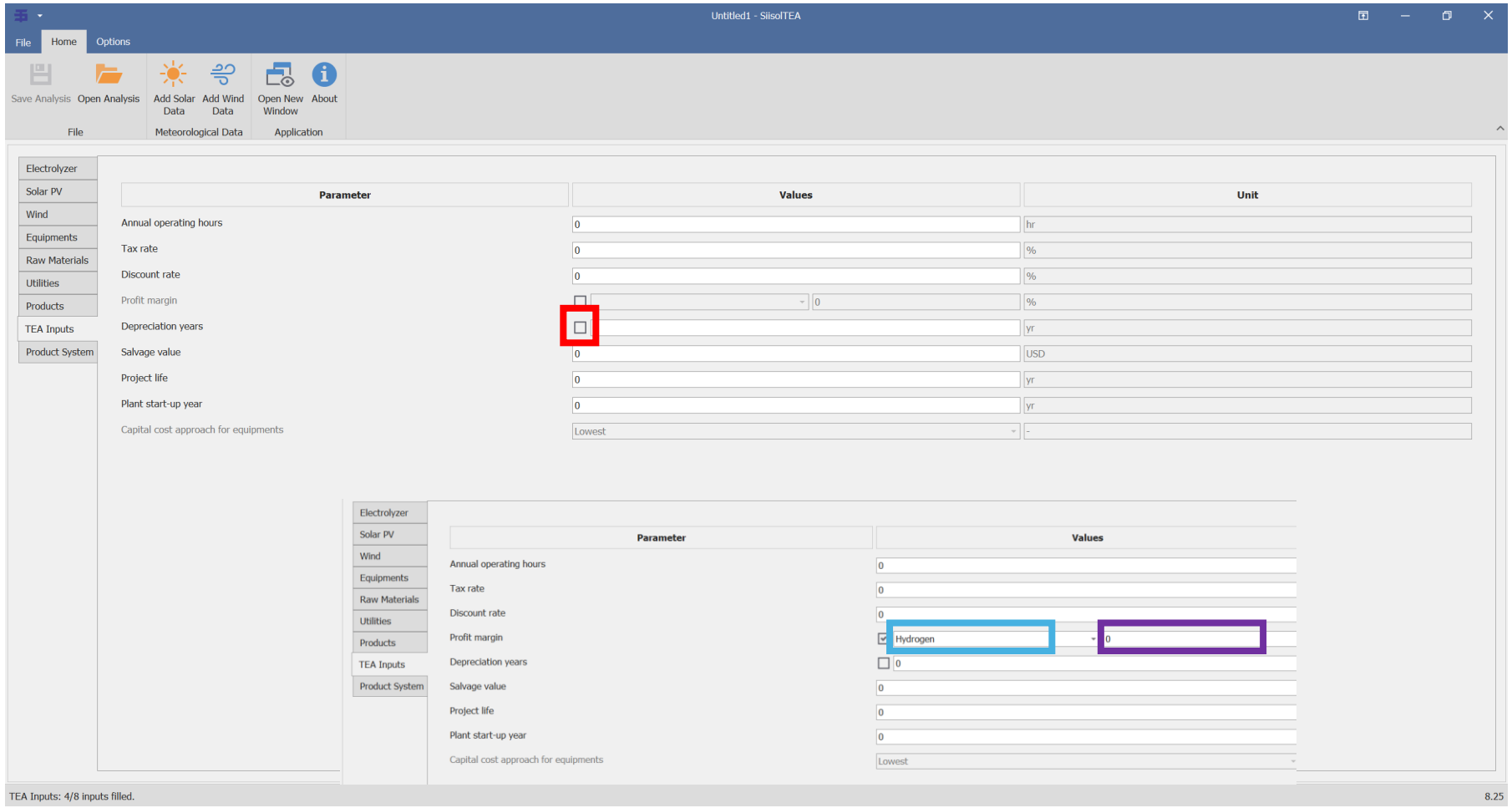
SiisolTEA enables users to evaluate the system based on profit margins. Just select the highlighted checkbox, choose the desired product, and enter the margin percentage.



Key

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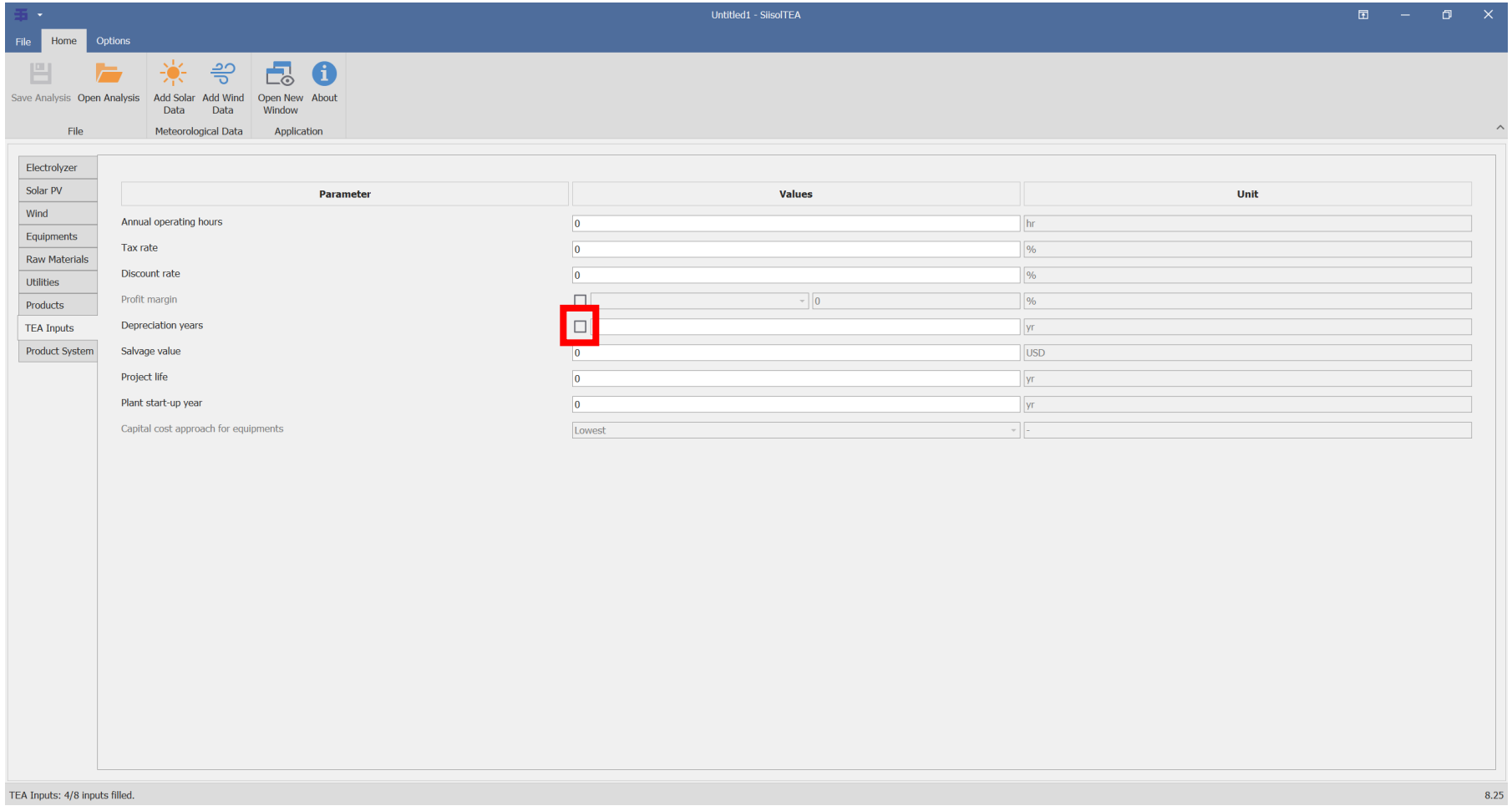
SiisolTEA enables users to analyze the system using either straight-line depreciation or accelerated depreciation. By default, the software applies the straight-line depreciation method; to switch to accelerated depreciation, simply select the highlighted checkbox.



Key

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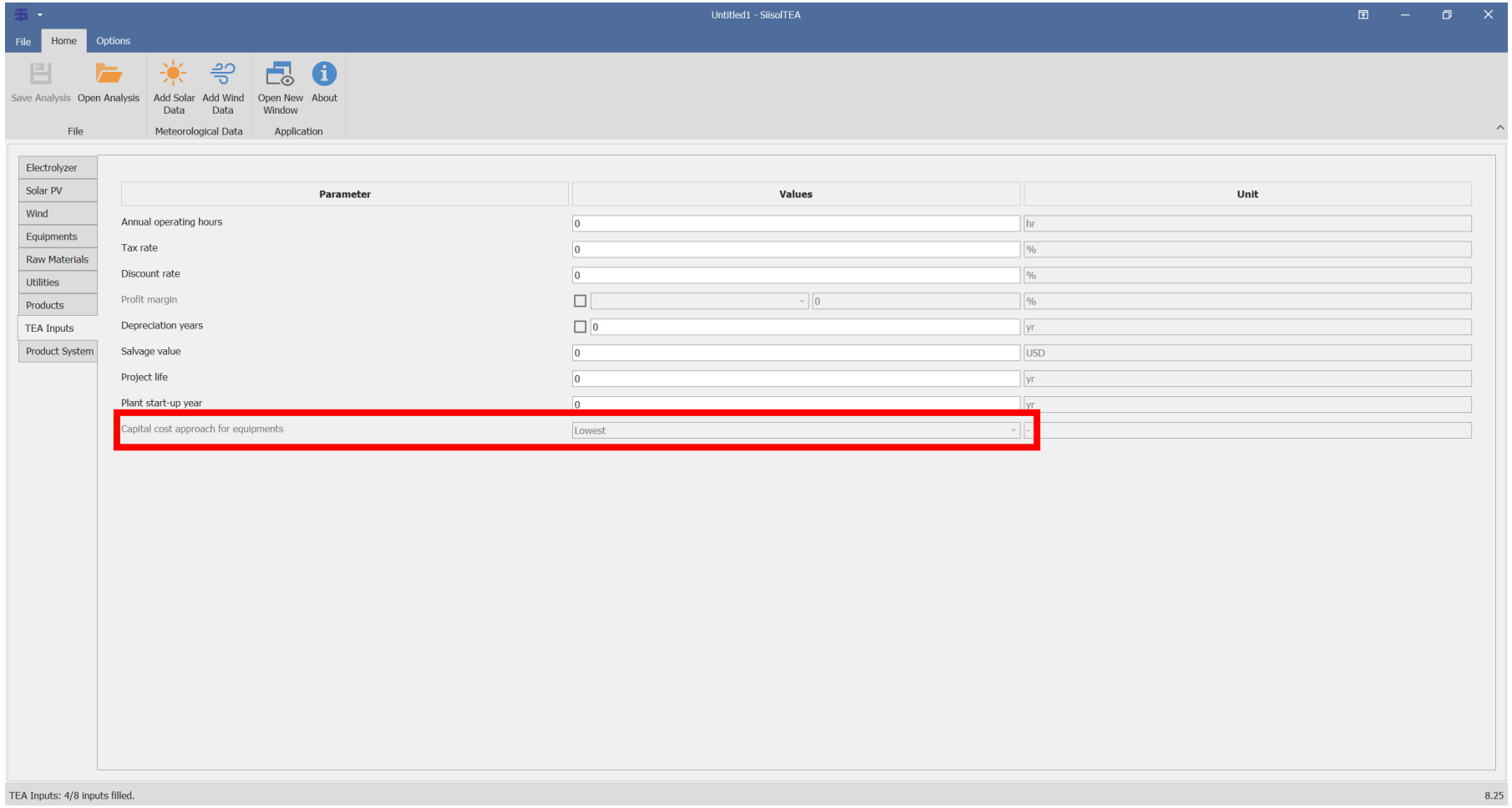
If the user selects the capital cost for solar, wind, or electrolyzer from the software database, this field will request the cost methodology, based on the ranges specified by IEA and IRENA.



Key

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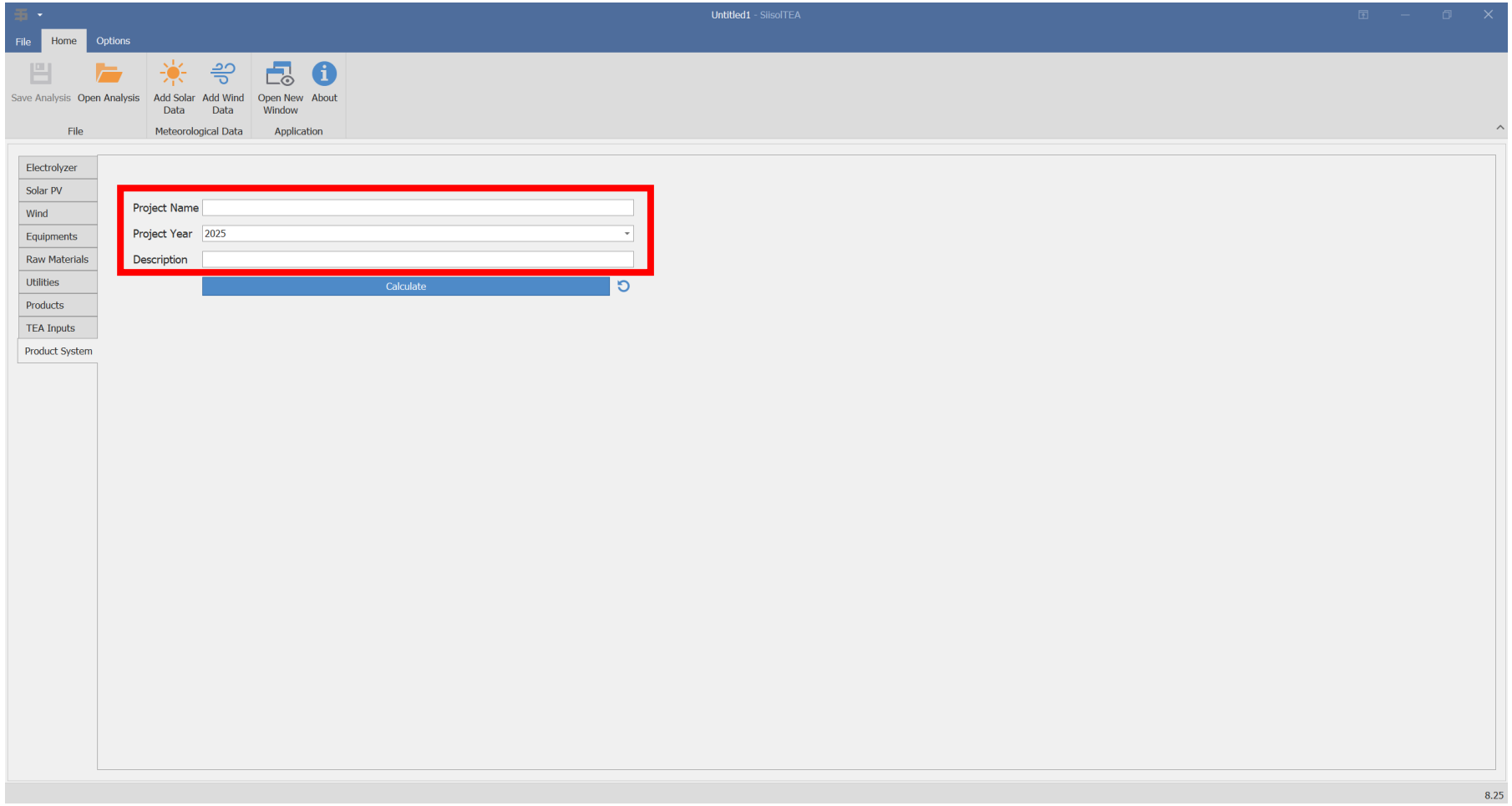
Users have the ability to assign unique project names to each analysis and utilize the description box for comprehensive notes. Selecting the appropriate Project Year is essential when capital costs for solar, wind, or electrolyzer are sourced from the software's database.



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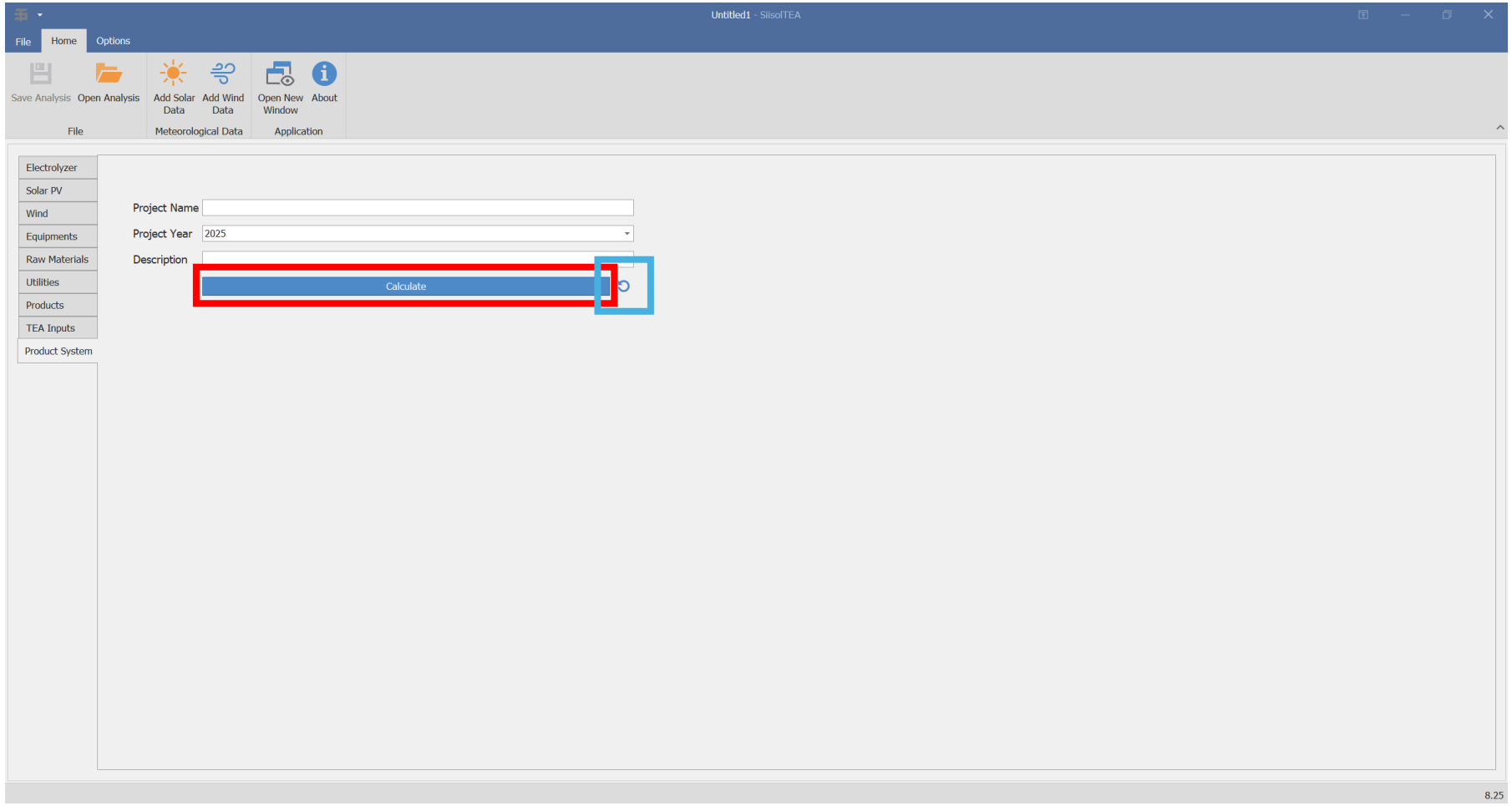
After entering all the required inputs, click the Calculate button to obtain the results. Once the results are displayed, users will no longer be able to modify any inputs unless they click the reset button located to the right of the Calculate button.



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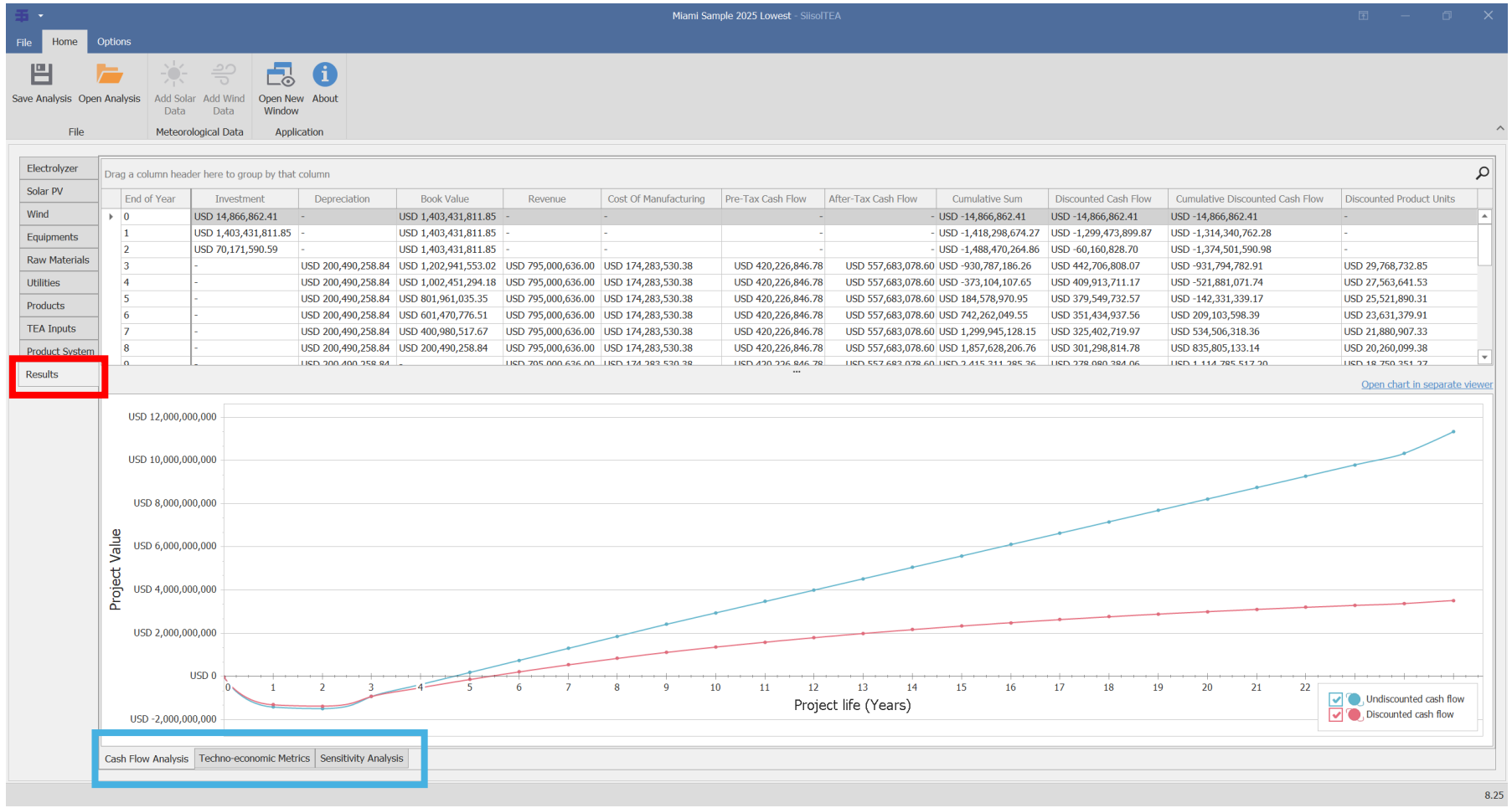
After the results are generated, a new Results tab will appear in the left panel. Within this tab, three additional tabs will be displayed just above the status bar.



Key

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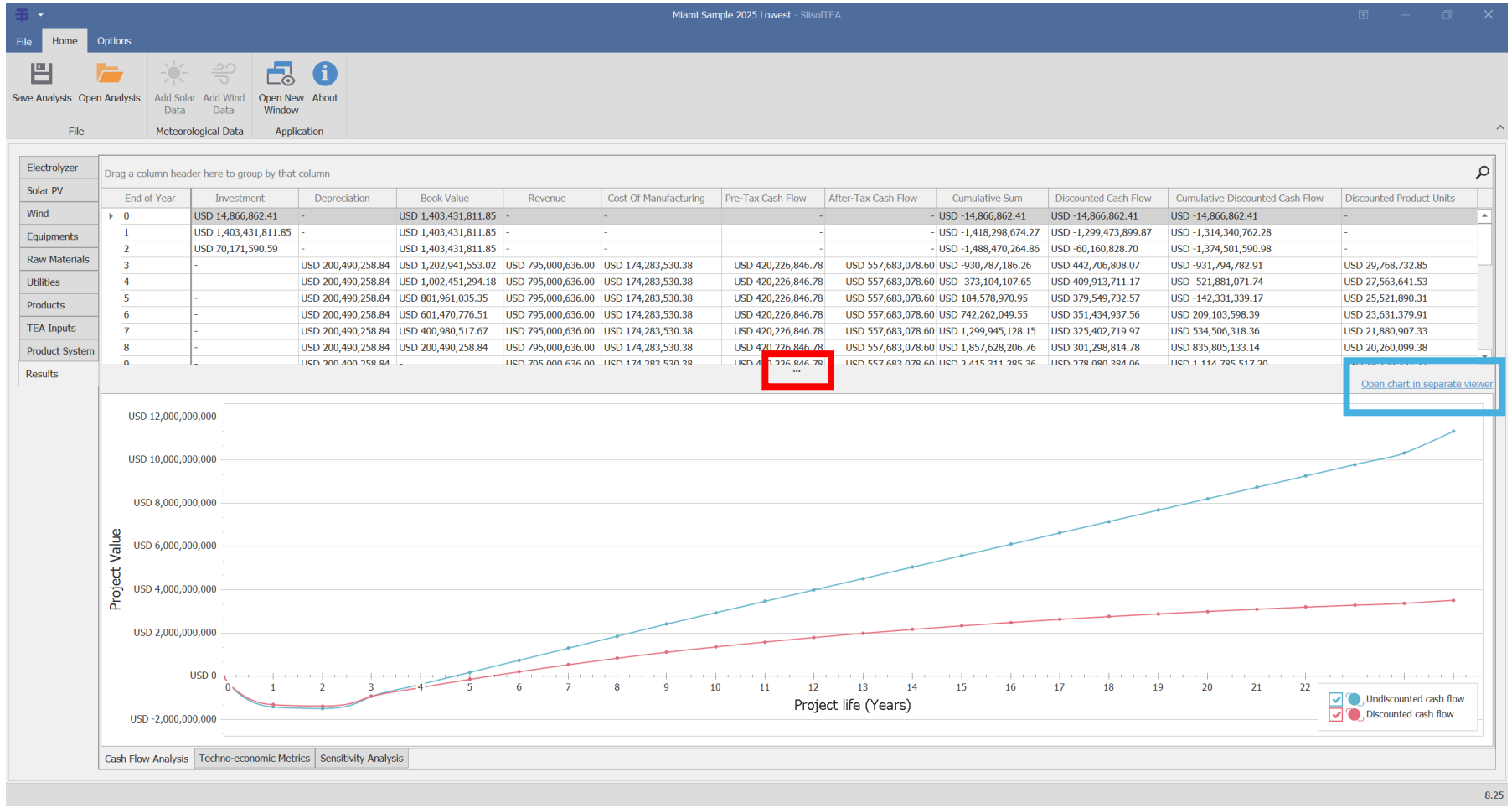
Users can drag the separator vertically to adjust the size of each panel (highlighted in red). Additionally, hovering over the graph displays the values at each data point. Users also have the option to open the chart in a separate viewer for a more detailed view.



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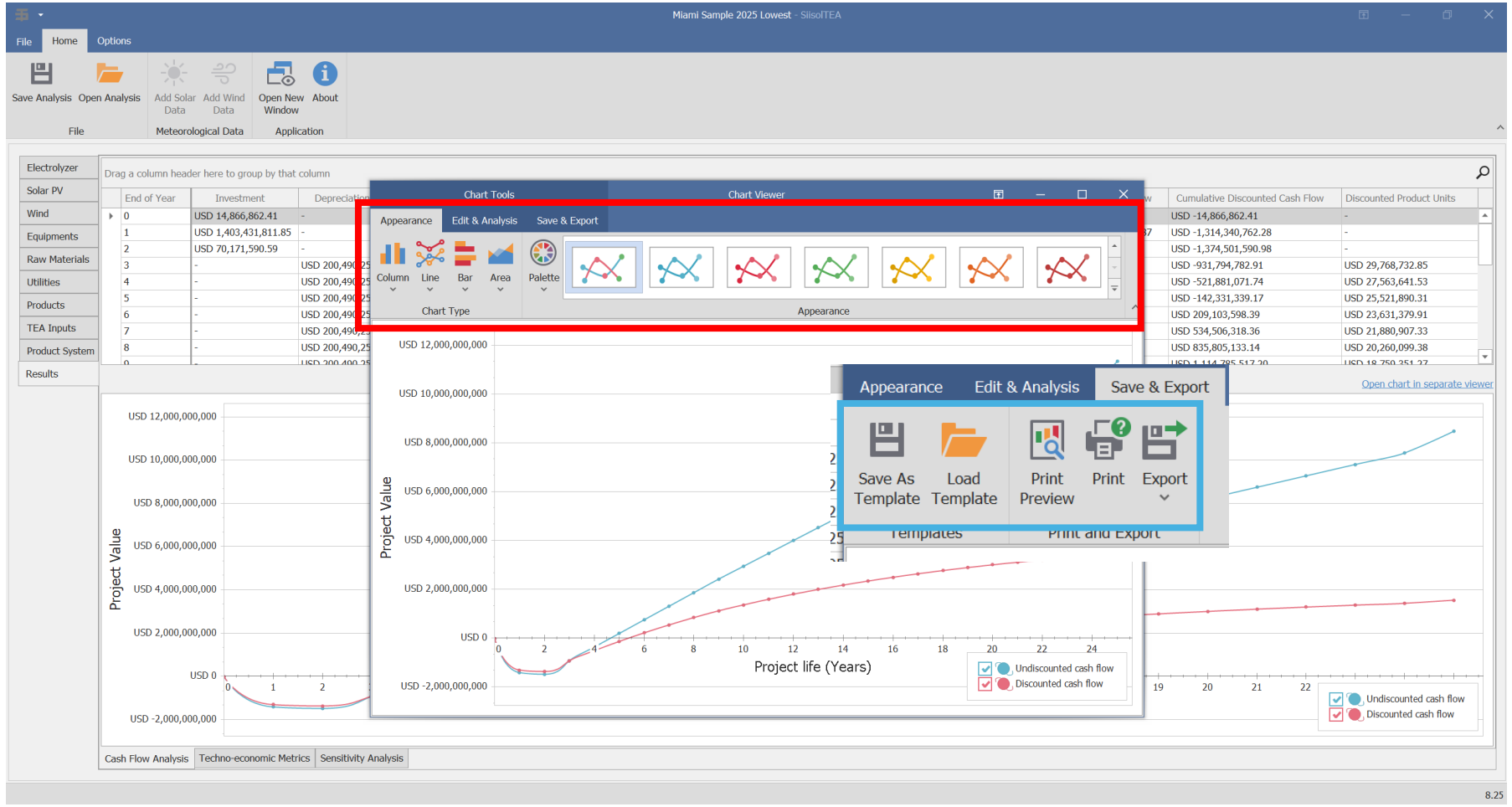
The chart viewer enables users to personalize charts by selecting the type and adjusting the appearance. Additionally, users can export charts in high-quality formats like SVG, ensuring they remain sharp and clear when included in presentations or documentation.



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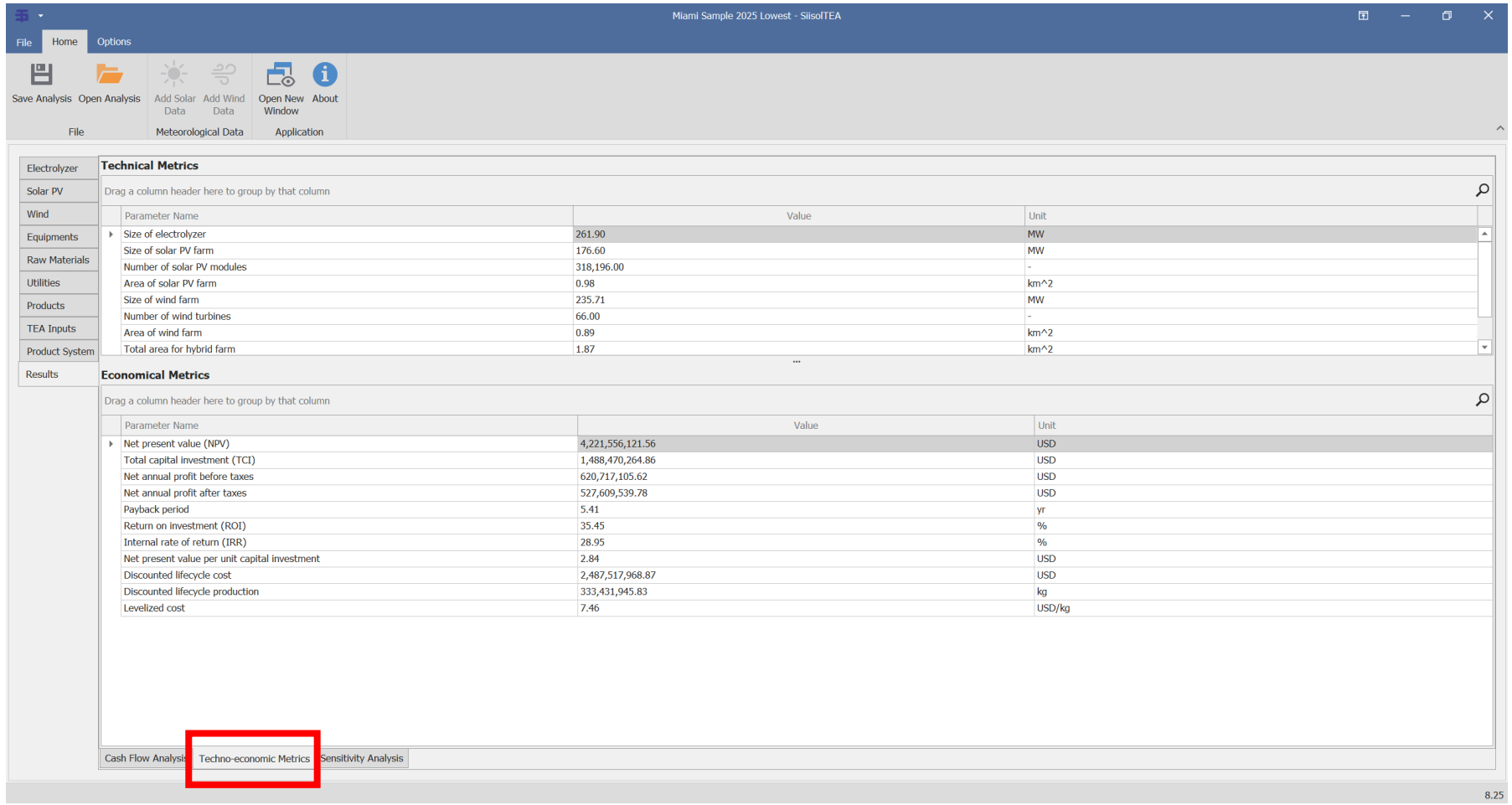
The findings encompass comprehensive techno-economic indicators can be found in the Techno-economic Metrics tab..



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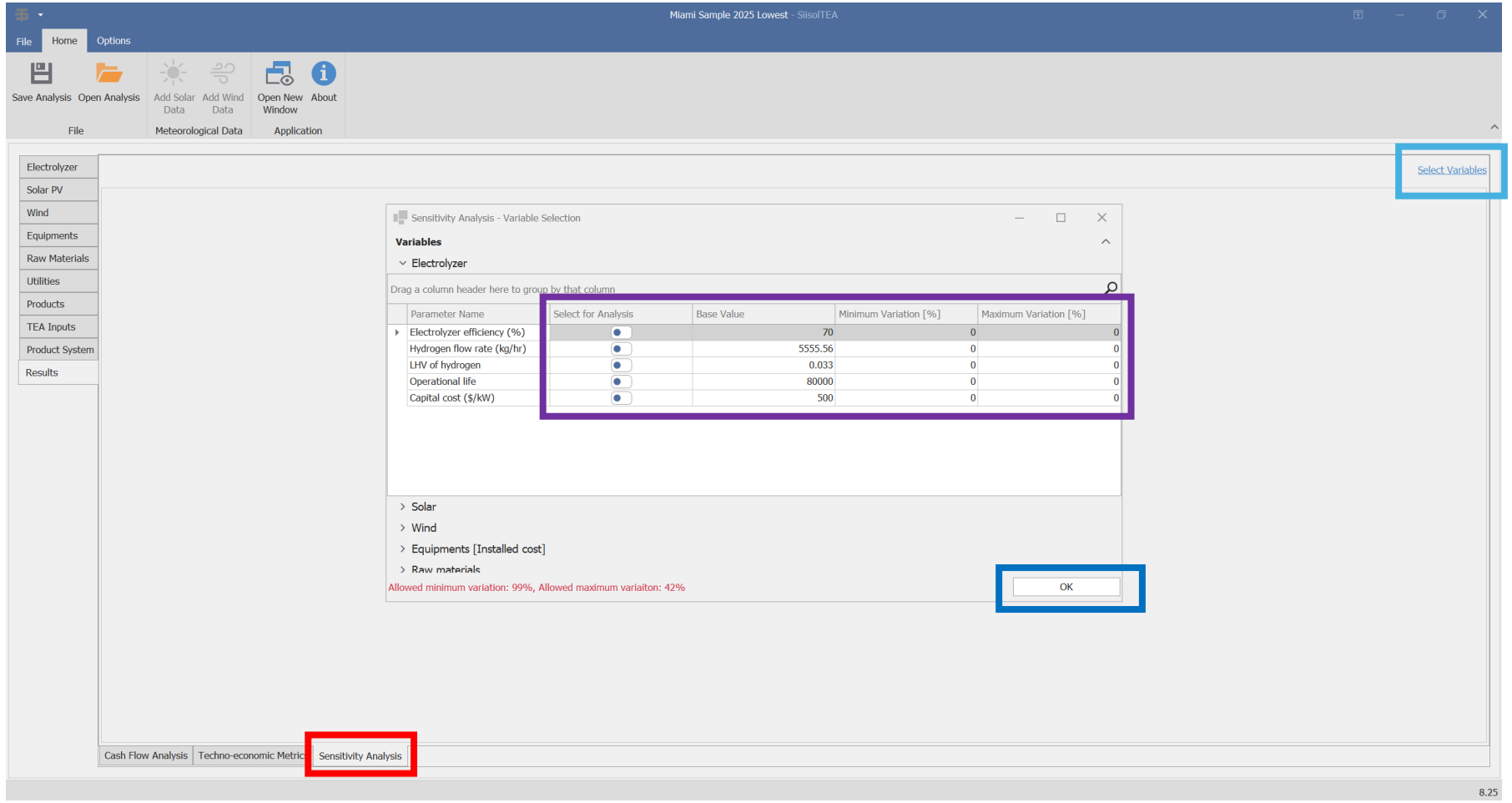
In addition to comprehensive techno-economic and cash flow evaluations, SiisolTEA offers an in-depth sensitivity analysis feature. Users can access this by navigating to the Sensitivity Analysis tab within the Results section, where they can choose variables and specify percentage variations.



Key

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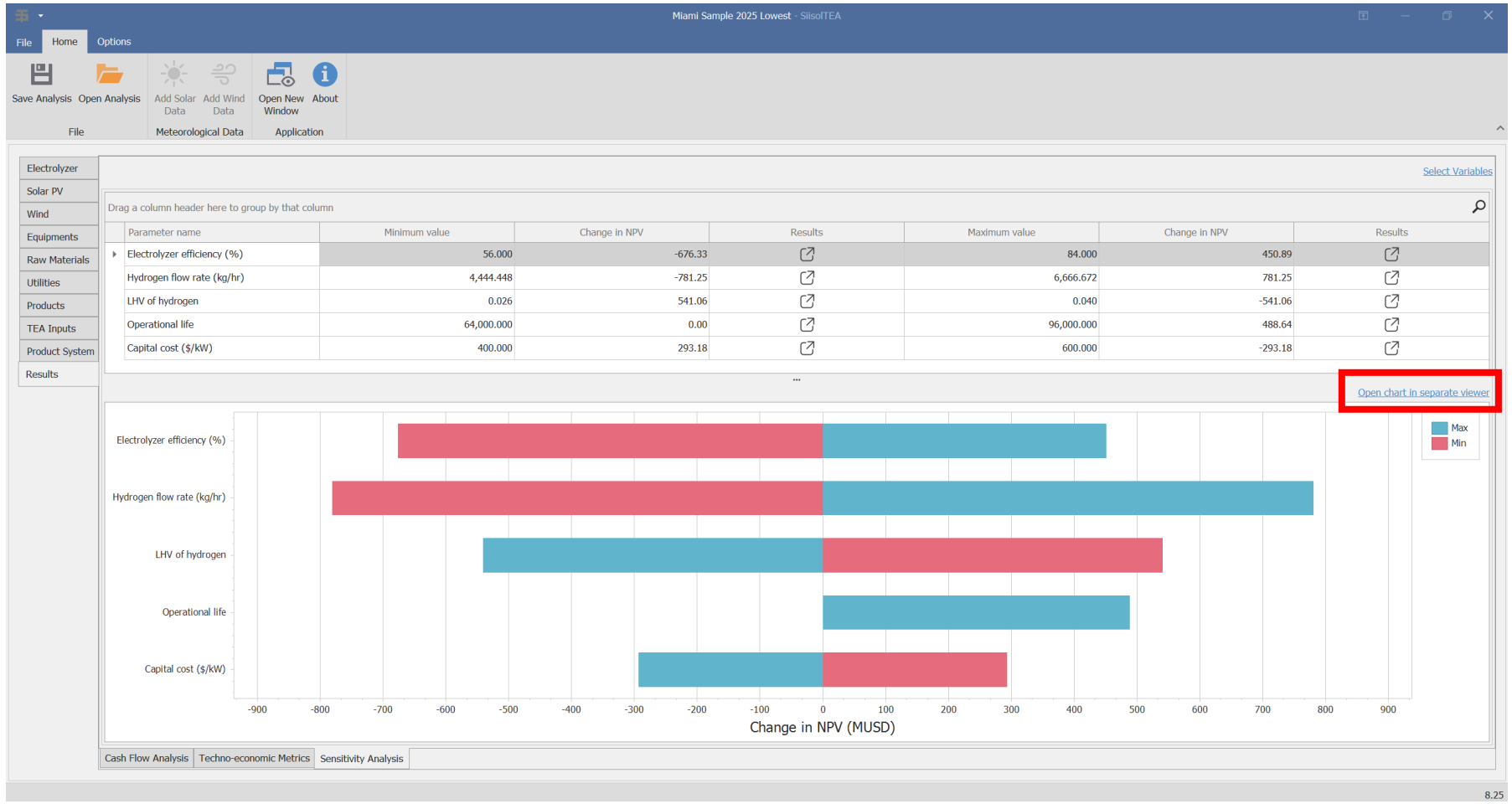
After the results are produced, the user can view the impact of the change as the Change in NPV of the project, presented both numerically and graphically. The chart, similar to cashflow chart, is customizable and exportable using the Chart Viewer.



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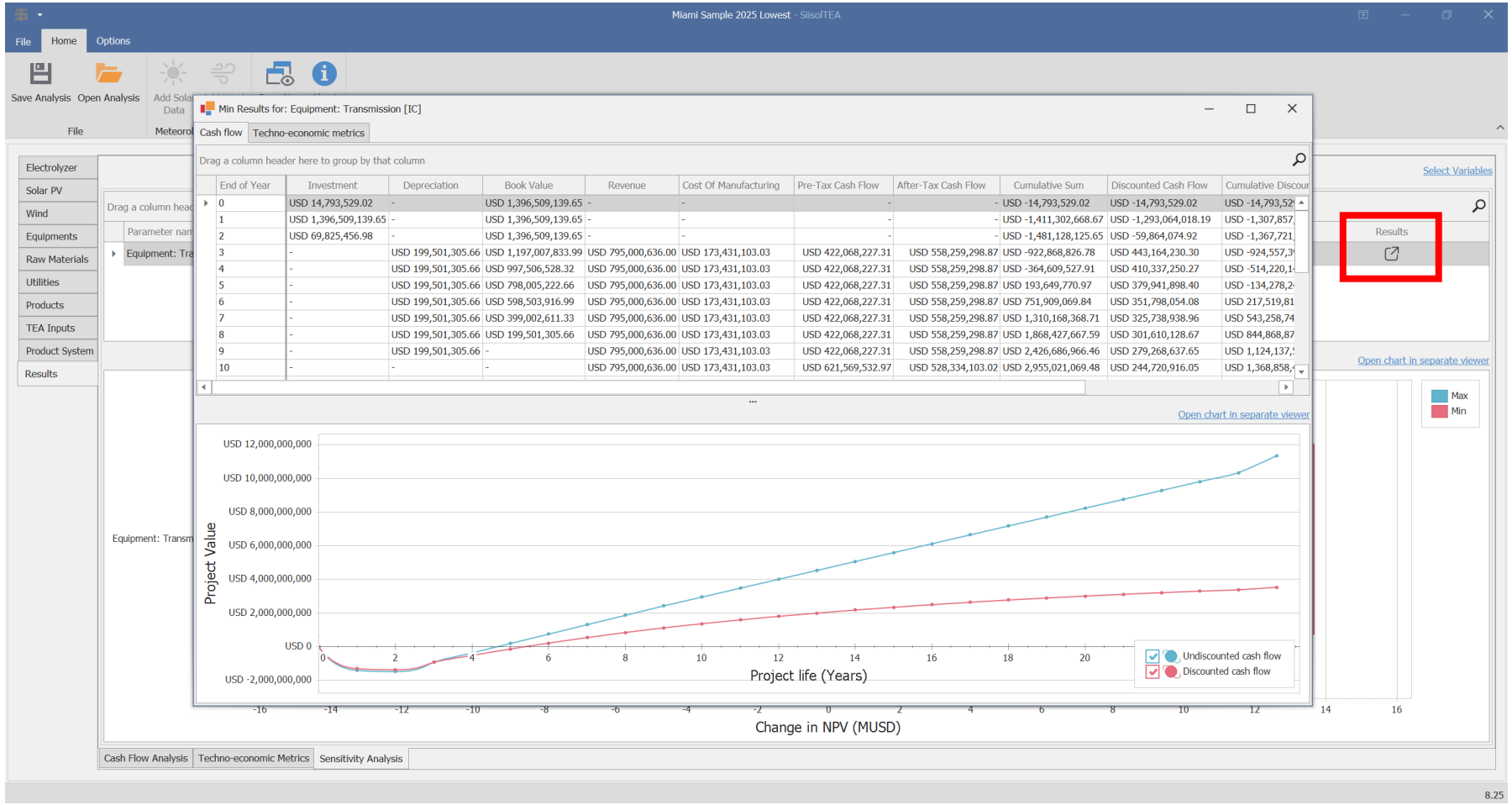
In addition to estimating the change in the system's NPV, the Sensitivity Analysis provides comprehensive techno-economic and cash flow details for each variation. Simply click the links in the results column to open a new window displaying the detailed results.



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The End

Thank you!