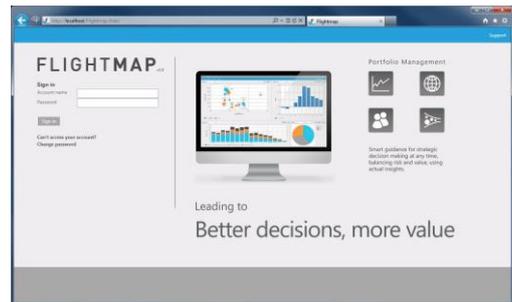


Introduction

This use case describes an example of the portfolio composition optimization functionality in FLIGHTMAP release 4.0.

In order to support better portfolio decisions, FLIGHTMAP offers an easy way to compare different portfolio compositions. In each portfolio composition, a different set of projects (or even different variants of one project) can be included. Based on how well these compositions meet strategic and financial goals and how realistic they are in terms of risk, resources, and funding, the best composition can be decided upon.



In addition to building portfolio composition proposals from manual selection, FLIGHTMAP's optimization functionality can support the decision-making process by calculating compositions that maximize a certain portfolio KPI while meeting all relevant constraints. These optimized compositions can then be adjusted and fine-tuned to include all relevant aspects of portfolio management.

This use case presents the steps in this process:

1. Determine the main portfolio goals and associated KPIs, and relevant constraints;
2. Build the compositions as input for the decision;
3. Analyze and decide about best portfolio composition.

Each of these steps is illustrated in the next paragraphs, for a demonstration Cleantech portfolio.

Determine portfolio goals and constraints

In the portfolio management process, a number of goals must be addressed. In this use case we want to build a CleanTech portfolio with maximum strategic and financial value for the company:

- Strategic value is based on the Attractiveness Key Performance Indicator, which is the compound value from a list of attractiveness criteria, and
- Financial value is modeled by the Net Present Value of each project's business case.

By looking at the Bubble chart in Figure 1, it is clear that trade-offs may be needed between strategic value and financial value.

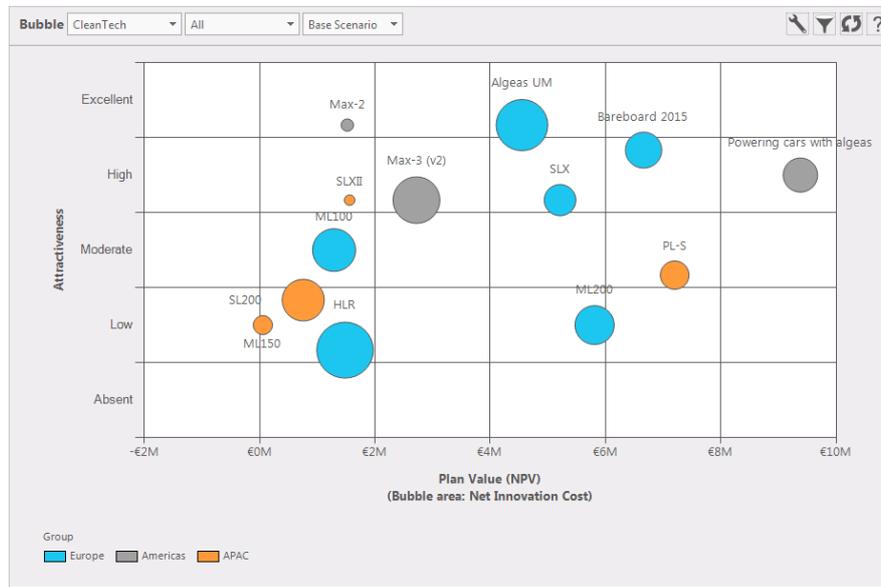


Figure 1 CleanTech projects Attractiveness and NPV, with bubble size showing innovation budget

In order to let FLIGHTMAP generate realistic portfolio compositions for this trade-off, a budget limit will be included. In this use case, we limit the innovation budget (Net Innovation Costs) for the current year 2013 up to the year 2020 (see Figure 2).

The Constraints tab includes the following settings:

Constraint	Time 1	Time 2	Time 3	Time 4
Constraint Reference Time	Q1 2011	Q4 2020	Not selected	Not selected
Portfolio Resource Constraints (fte/q)				
R&D mech	14	14	0	0
R&D electro	6	6	0	0
Production	6	6	0	0
BU	4	4	0	0
Portfolio Finance Constraints (€/q)				
Net Innovation Costs	€750,000	€750,000	€0	€0

Figure 2 Portfolio Data Settings entry: Constraints tab

Additional constraints in terms of capital budget and resource constraints can be entered in a similar way. It is beyond the scope of this use case to show how, but FLIGHTMAP also supports a minimum value for (incremental) profits or revenues, to make sure that only portfolio compositions are generated that meet business growth strategy.

Build and compare compositions

In order to prepare for the best possible portfolio, a number of alternative portfolio compositions can be build and compared. For our CleanTech portfolio, we will create three compositions:

- Value optimized, which maximizes the NPV with the budget constraint;
- Attractiveness optimized, which maximizes the Attractiveness score;
- Value and attractiveness, which is a manual combination of the previous two.

New portfolio compositions can be created from the Portfolio Data panel, via the New icon (☰). Each composition has its own Tab (see Figure 3). Each composition has its own name and description, an optimization variable and a set of constraints¹. The list of all projects in the CleanTech portfolio is available with a dropdown selection that specifies how to deal with the project in this composition.

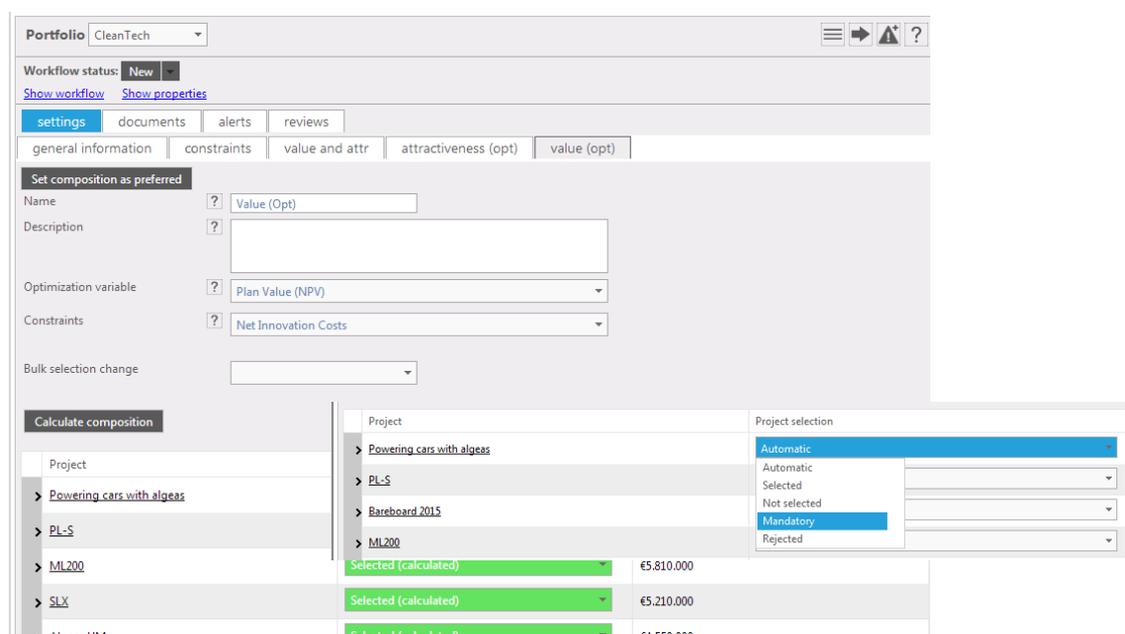


Figure 3 Portfolio Composition properties

Each project can have a status Selected, Not selected, Mandatory, Rejected, or Automatic. If a set of Automatic projects is available, then also the option to Calculate Composition is active.

In this use case example, we put all projects in the Value optimization composition on Automatic, and simply push the Calculate Composition button. FLIGHTMAP now calculates the portfolio composition for the maximum Net Present Value. In exactly the same way, the Attractiveness optimization composition is calculated (just with a different optimization value). Each project's status is now updated to reflect whether it was selected or not by the calculation.

¹ In more elaborate optimization use case, additional options such as strictness and constraint resolution (year/quarter) can also be specified.

Project	Project selection	Plan Value (NPV)
> Powering cars with algeas	Selected (calculated)	€9.380.000
> PL-S	Selected (calculated)	€7.200.000
> ML200	Selected (calculated)	€5.810.000
> SLX	Selected (calculated)	€5.210.000
> Algeas UM	Selected (calculated)	€4.550.000
> Max-2	Selected (calculated)	€1.520.000
> Bareboard 2015	Not selected (calculated)	€6.660.000
> Max-3 (v2)	Not selected (calculated)	€2.720.000
> SLXII	Not selected (calculated)	€1.560.000
> HLR	Not selected (calculated)	€1.480.000
> ML100	Not selected (calculated)	€1.290.000
> SL200	Not selected (calculated)	€756.000
> ML150	Not selected (calculated)	€55.000

Figure 4 Optimization results

After the composition has been calculated, it may be relevant to understand how and where the budget constraint has played out. In the Portfolio over time chart, stacked by project, with the Constraints option switched on as well as the option to show unselected projects, the composition is shown over the constraint time period.

It is clear that several projects are not selected since the 2014 budget is limited.

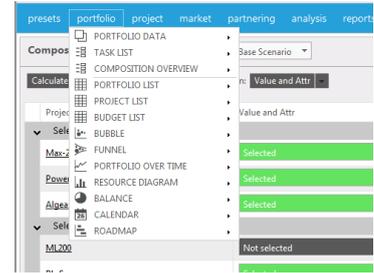


Figure 5 Portfolio over time reveals budget constraint

Of course, the same analysis can be done with other constraints (both in the Portfolio over time and in the Resource chart).

Analyze and decide

The Portfolio menu offers the Composition Overview, which will show all compositions in our portfolio side-by-side. The smart grouping in this List first shows the projects that are the same in each composition, then the ones that are not, and finally the projects that are included in none of the compositions.



By looking at this middle section (see Figure 6), a mix of projects that best meets both strategic and financial goals can be selected. By clicking on a project in the Bubble chart in this set-up, the selection status of the project is toggled in the active composition.

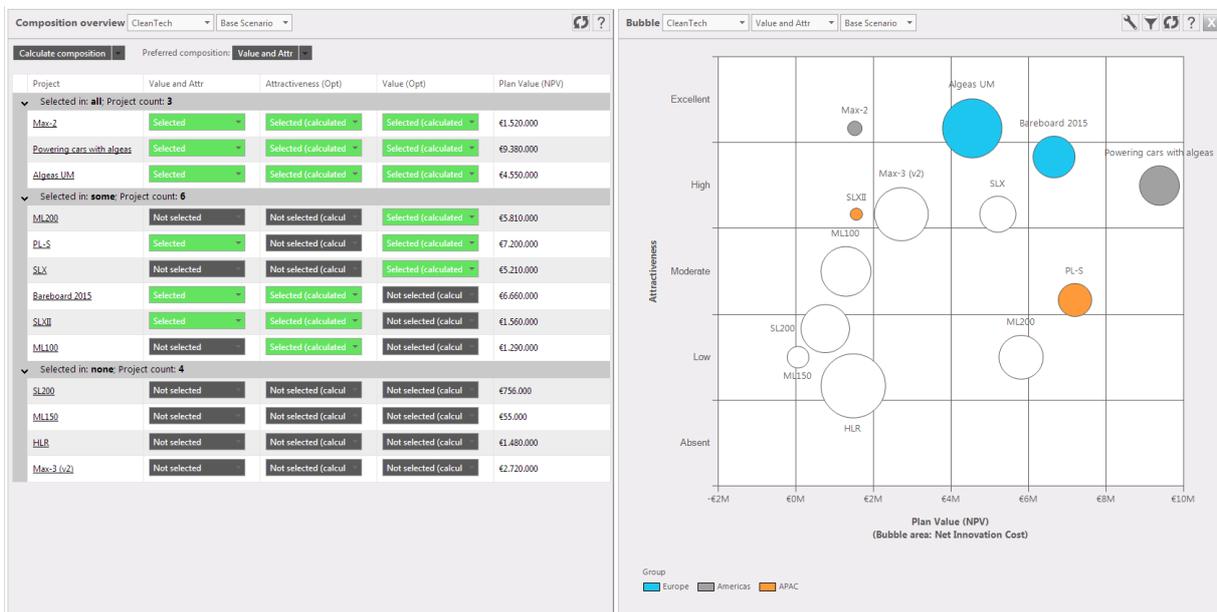


Figure 6 Combining compositions

If during this portfolio composition analysis, one of the projects is changed, or even one of the constraints, FLIGHTMAP signals that the Calculation should be updated. After each new Calculation, it also reveals which projects have changed status in the newly calculated composition (from in to out or from out to in) as indicated in Figure 7.

Calculate composition		
Project	Project selection	Plan Value (NPV)
> Powering cars with algae	Selected (calculated)	€9.380.000
> PL-S	Selected (calculated)	€7.200.000
> Bareboard 2015	Selected (calculated)	€6.660.000
> SLX	Selected (calculated)	€5.210.000
> Max-3 (v2)	Selected (calculated)	€2.720.000
> SLXII	Selected (calculated)	€1.560.000
> ML200	Not selected	€5.810.000
> Algeas UM	Not selected (calculated)	€4.550.000
> Max-2	Not selected (calculated)	€1.520.000
> HLR	Not selected (calculated)	excluded in last calculation

Figure 7 Changes in calculated composition are marked

Now that the analysis has resulted in a final preferred composition for the CleanTech portfolio, this composition is set as the Preferred composition. This is the composition that is included in all the portfolio analyses and reports by default.

Conclusion

The real-time optimization and analysis provide a solid foundation for better trade-offs across multiple options and constraints. With the optimization functionality, FLIGHTMAP supports an efficient and effective decision-making process.

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