Financing and Portfolio Analysis of Renewable Energy Projects

September 2011

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Overview

- Matobis AG and the Microstep-Alliance
- Range of services
- Due Diligence
- Cash flow modelling
- Term sheet concept
- Scenario manager
- Portfolio manager and Reporting
- Fond manager and Reporting

Matobis and Microstep-Alliance

- Matobis AG is a member of the Microstep-Alliance, a team of corporate and investment banking experts, in the area of project financing, structuring, risk and asset / liability management, modelling and software development
- Services
  - Consulting and Financial Engineering
  - Risk-Management, Portfolio optimization, Corporate and Project financing
  - Risk Analysis and quantitative Research
- Business model
  - Consulting
  - Product licencing
  - Equity investment

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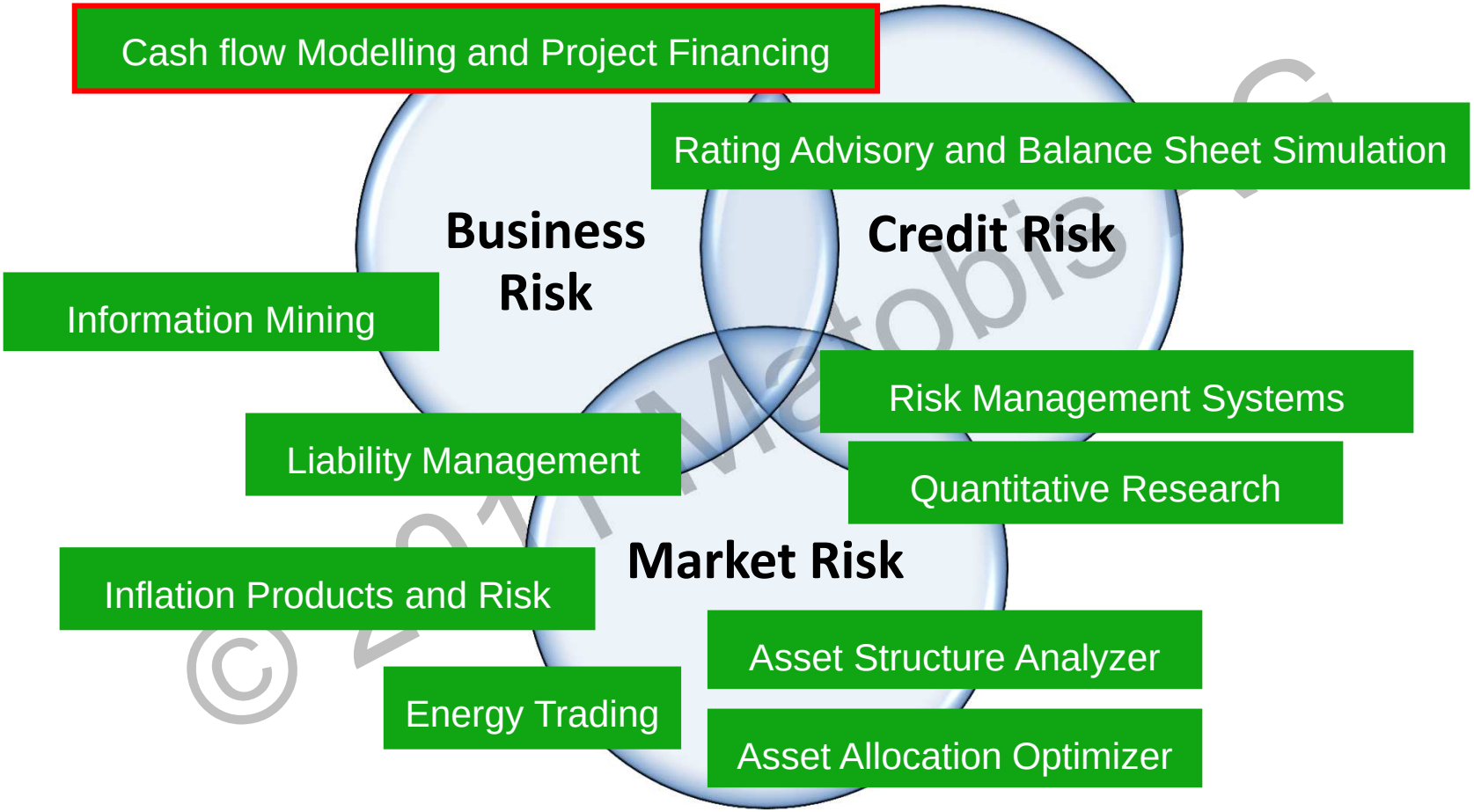
Microstep-Alliance

Risk Categories, Solutions and Consulting



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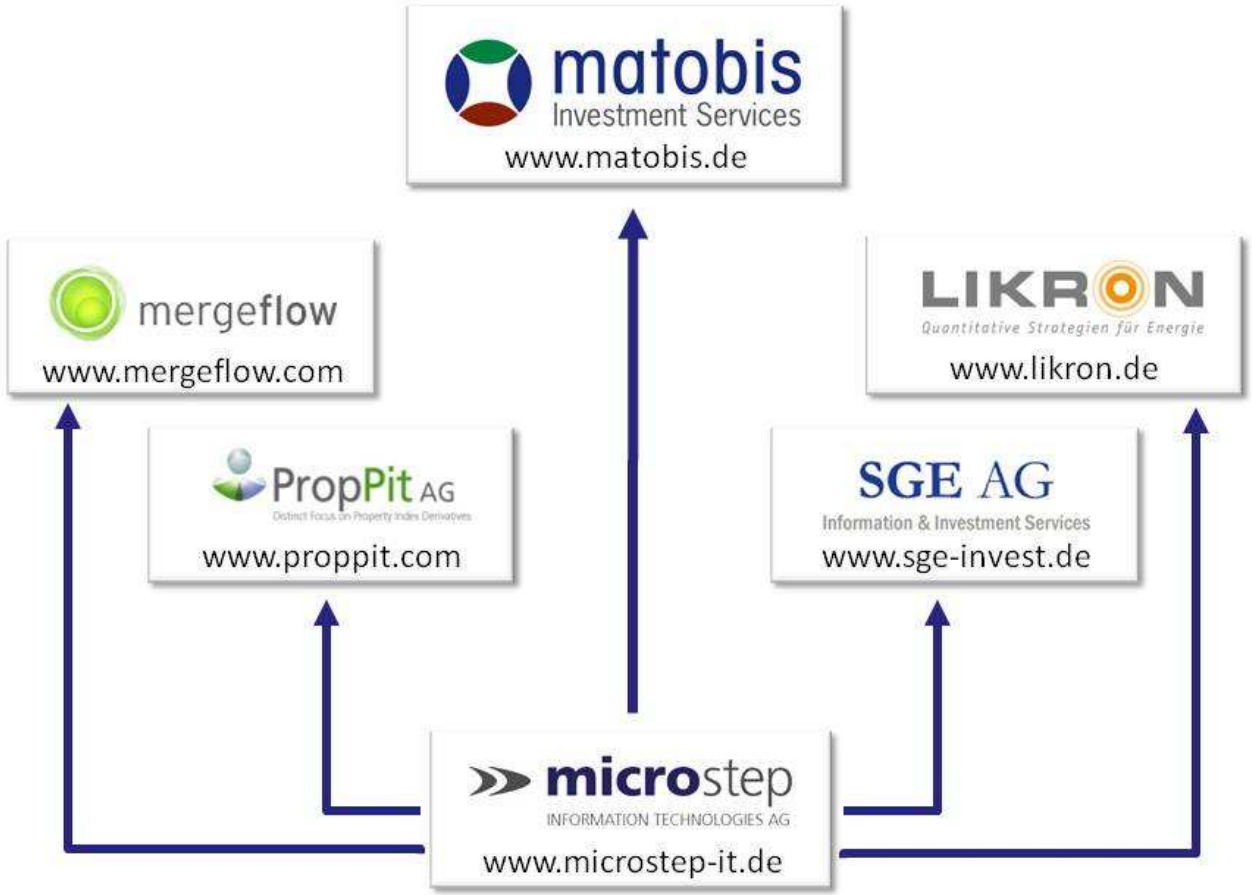
Microstep-Alliance



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Range of services

- Due Diligence and project valuation
- Project and portfolio structuring
- Project cash flow modelling in planning, construction and operating phases
- Risk analysis using sensitivity analysis and stress testing
- Optimization of equity and debt structures
- Consulting for project developer, equity and debt investors
- Market risk analysis and hedging strategies for debt investors
- Quantitative research and case studies
- Licencing of cash flow modelling software

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Due Diligence

- Evaluation of the major cash flow relevant contract components in the construction and operating phase
- Analysis of the existing financing structure including market and credit risk components
- Plausibility check of the key model assumptions
- Disclosure of potential short comings and inconsistencies in the model assumptions
- Mapping of major components in the cash flow model and project evaluation
- Sensitivity analysis and stress testing (using the Scenario-Manager)
- Re-evaluation under adjusted model assumptions

Cash flow modelling

- The model provides the analysis of projects in the planning construction and operating phase.
- The cash flow models delivers bank compatible key figures and reporting. The models are very versatile and may be applied to energy projects like solar thermal, photovoltaic, geothermal and wind energy and biogas plants, etc.
- The models enable to analyze project risks and optimize financing structures

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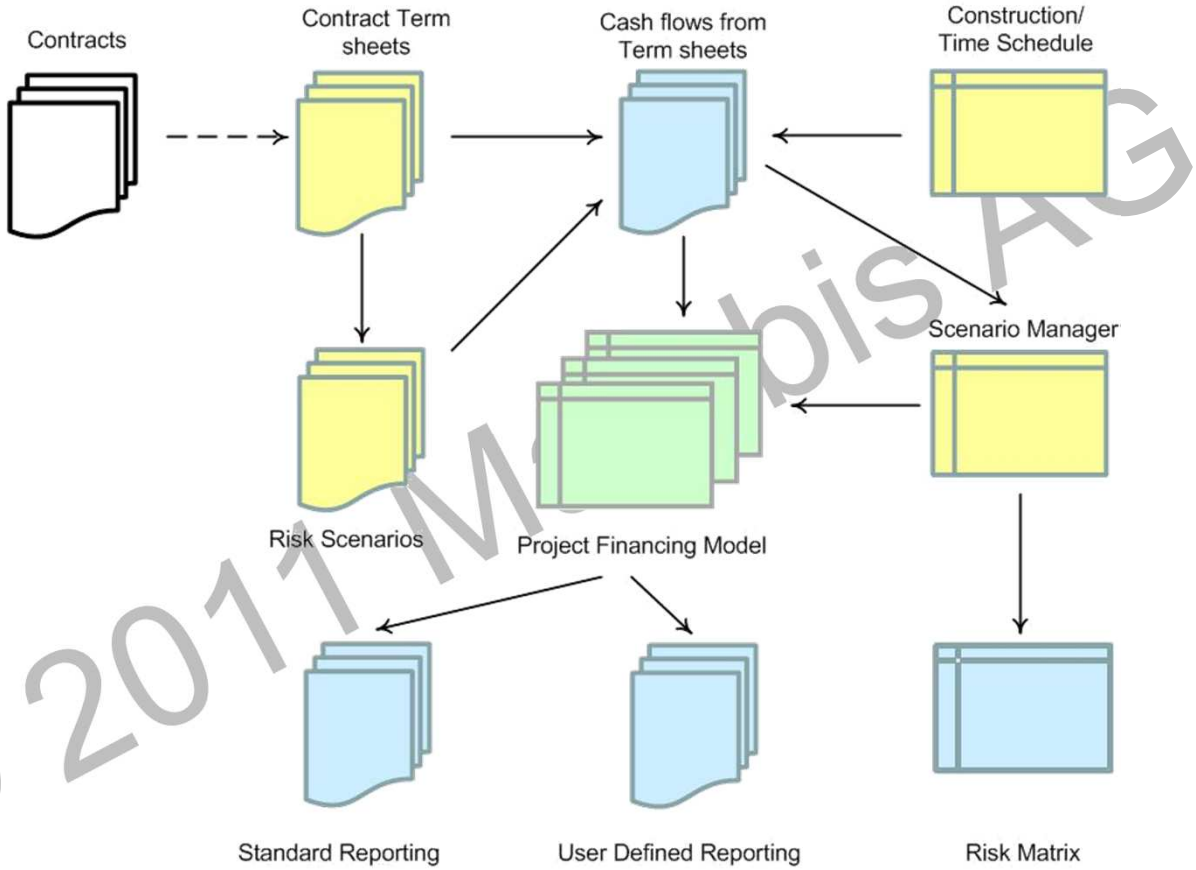
Cash flow modelling

- The term sheet concept:
  The cash flow model is embedded in a workflow that starts at the contract specification of the major components that are structured in term sheets.

- Term sheets are the formalized and standardized interface to the cash flow model. They enable also an efficient communication between all involved parties.

- An important input to the cash flow model are payment cash flows generated from the term sheets and the construction schedule.

Cash flow modelling and risk analysis



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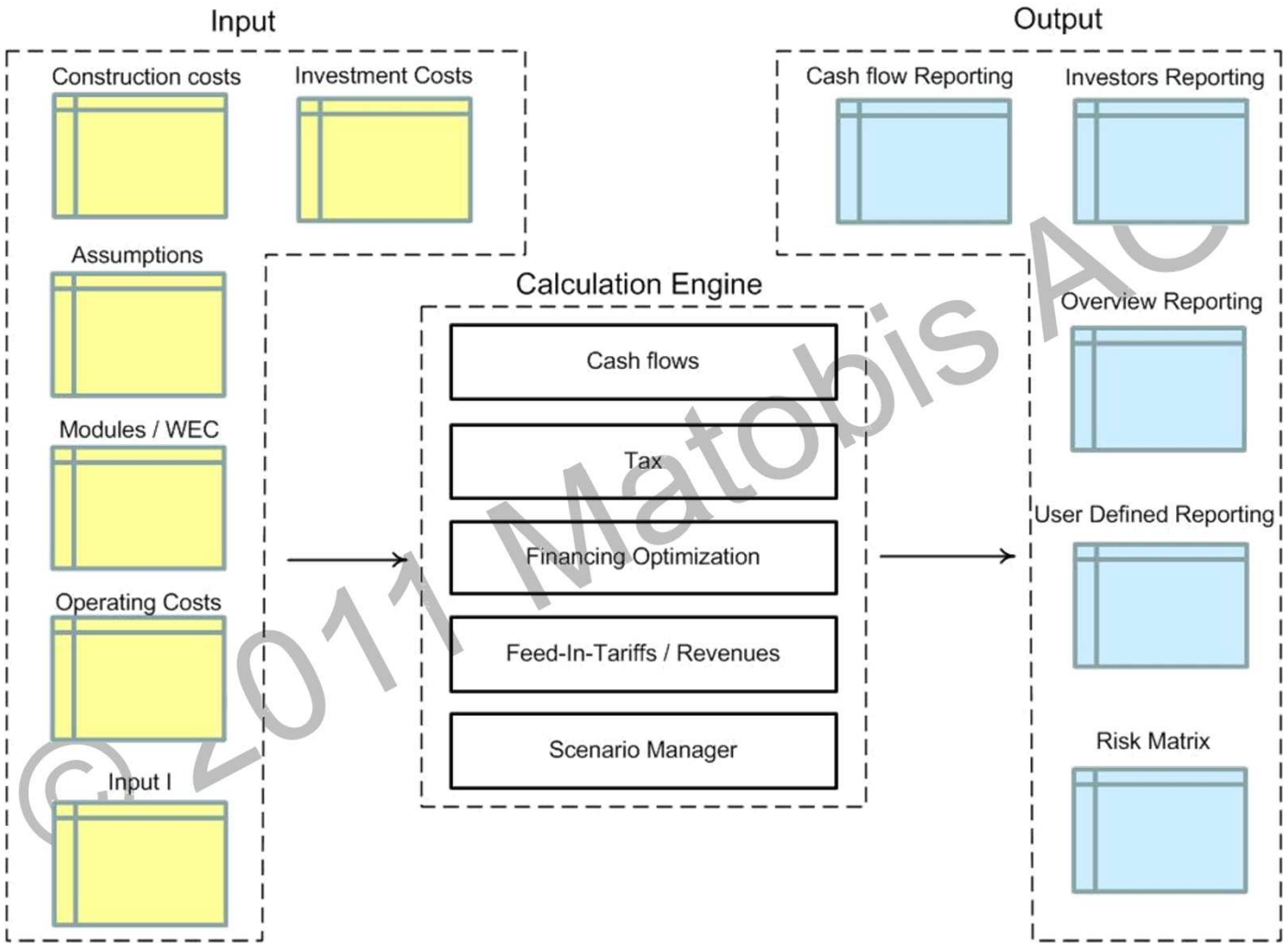
Cash flow modelling : Project level



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Scenario-Manager

- Management of risk scenarios
  - Static scenarios: defined through parameter values
  - Dynamic scenarios: defined through parameter ranges
  - Dynamic external scenarios: defined through risk scenario term sheets
- Definition of risk figures (risk matrix value)
- Calculation of the risk scenarios in batch mode
- Calculation of the risk scenarios and the risk matrix

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Analysis result : Risk matrix

Risk parameter/factor

Risk scenario

Risk Measure		Feed-in tariff	DSCR Target 1.400		Investment costs EUR		Equity Investment EUR		Senior Debt EUR		enior Interest Rat		Equity IRR (P50)		Project IRR (P50)		qui
			Min.	Average	absolute	relative	absolute	relative	absolute	relative	absolute	relative	absolute	relative	absolute	relative	
Base Scenario																	
Sc_1	Base Case	0.2857	1.402	1.662	2,128,500		425,700		1,702,800		6.00%		29.05%		12.38%		1,2
Financing																	
Debt service cover ratio																	
Sc_2	Senior DSCR 1.5	0.2857	1.502	46.890	2,128,500	0.0%	638,550	50.0%	1,489,950	-12.5%	6.00%	0.0%	21.49%	-26.0%	12.28%	-0.8%	1,4
Sc_3	Senior DSCR 1.6	0.2857	1.602	1.795	2,128,500	0.0%	638,550	50.0%	1,489,950	-12.5%	6.00%	0.0%	22.55%	-22.4%	12.30%	-0.6%	1,4
Financial Ratios																	
Sc_4	Equity 30% of total invest.	0.2857	1.402	92.058	2,128,500	0.0%	638,550	50.0%	1,489,950	-12.5%	6.00%	0.0%	20.49%	-29.5%	12.25%	-1.0%	1,4
Sc_5	Equity 50% of total invest.	0.2857	1.402	92.058	2,128,500	0.0%	638,550	50.0%	1,489,950	-12.5%	6.00%	0.0%	20.49%	-29.5%	12.25%	-1.0%	1,4
Sc_6	Equity 100% of total invest.	0.2857	1.402	92.058	2,128,500	0.0%	638,550	50.0%	1,489,950	-12.5%	6.00%	0.0%	20.49%	-29.5%	12.25%	-1.0%	1,4
Senior Interest Rate																	
Sc_7	Spread senior140 Bp	0.2857	1.402	92.477	2,128,500	0.0%	638,550	50.0%	1,489,950	-12.5%	5.00%	-16.7%	21.05%	-27.5%	12.16%	-1.8%	1,4
Sc_8	Spread senior 340 Bp	0.2857	1.402	92.067	2,128,500	0.0%	638,550	50.0%	1,489,950	-12.5%	7.00%	16.7%	19.86%	-31.6%	12.35%	-0.2%	1,3
Sc_9	Spread senior 440 Bp	0.2857	1.402	46.757	2,128,500	0.0%	638,550	50.0%	1,489,950	-12.5%	8.00%	33.3%	19.22%	-33.8%	12.46%	0.7%	1,3
Sc_10	Spread senior 640 Bp	0.2857	1.080	1.373	2,128,500	0.0%	638,550	50.0%	1,489,950	-12.5%	10.00%	66.7%	17.72%	-39.0%	12.71%	2.7%	1,1
Construction Costs																	
System Price																	
Sc_11	System price 2000 l/kWp	0.2857	1.402	93.607	2,029,500	-4.7%	608,850	43.0%	1,420,650	-16.6%	6.00%	0.0%	22.01%	-24.2%	13.09%	5.7%	1,4
Sc_12	System price 1800 l/kWp	0.2857	1.402	137.671	1,831,500	-14.0%	549,450	29.1%	1,282,050	-24.7%	6.00%	0.0%	25.48%	-12.3%	14.99%	21.1%	1,5
Sc_13	System price 1600 l/kWp	0.2857	1.402	182.799	1,633,500	-23.3%	490,050	15.1%	1,143,450	-32.8%	6.00%	0.0%	29.61%	1.9%	17.28%	39.6%	1,6
Sc_14	System price 1500 l/kWp	0.2857	1.402	228.056	1,534,500	-27.9%	460,350	8.1%	1,074,150	-36.9%	6.00%	0.0%	31.99%	10.1%	18.62%	50.4%	1,7
Tariffs																	
Tariff3																	
Sc_15	Tariff3 shortaing	0.2857	1.402	92.058	2,128,500	0.0%	638,550	50.0%	1,489,950	-12.5%	6.00%	0.0%	20.25%	-30.3%	12.04%	-2.7%	1,3
Degradation																	
Degradation Increase																	
Sc_16	Increase of Degradation to 1%	0.2857	1.402	92.098	2,128,500	0.0%	638,550	50.0%	1,489,950	-12.5%	6.00%	0.0%	19.58%	-32.6%	11.70%	-5.5%	1,3
Tax																	
Depreciation Method																	
Sc_17	Depreciation Declining-Straigh	0.2857	1.402	92.130	2,128,500	0.0%	638,550	50.0%	1,489,950	-12.5%	6.00%	0.0%	21.17%	-27.1%	12.55%	1.4%	1,4
Sc_18	Depreciation Declining	0.2857	1.402	92.128	2,128,500	0.0%	638,550	50.0%	1,489,950	-12.5%	6.00%	0.0%	21.05%	-27.5%	12.46%	0.6%	1,4
Tax (all in one %)																	
Sc_19	Tax 10% (all in)	0.2857	1.402	92.915	2,128,500	0.0%	638,550	50.0%	1,489,950	-12.5%	6.00%	0.0%	22.22%	-23.5%	13.20%	6.6%	1,5
Sc_20	Tax 30% (all in)	0.2857	1.402	92.061	2,128,500	0.0%	638,550	50.0%	1,489,950	-12.5%	6.00%	0.0%	18.64%	-35.8%	11.28%	-8.9%	1,2
Relation between system costs and minimum feed in tariff																	
Equity IRR minimum 12%, Debt serive coverage ratio minimum 1.4																	
Sc_21	2000 l/kWp	0.2250	1.402	2.468	2,029,500	-4.7%	710,325	66.9%	1,319,175	-22.5%	6.00%	0.0%	12.28%	-57.7%	8.84%	-28.5%	1,0
Sc_22	1800 l/kWp	0.2050	1.402	1.686	1,831,500	-14.0%	641,025	50.6%	1,190,475	-30.1%	6.00%	0.0%	12.29%	-57.7%	8.87%	-28.3%	9

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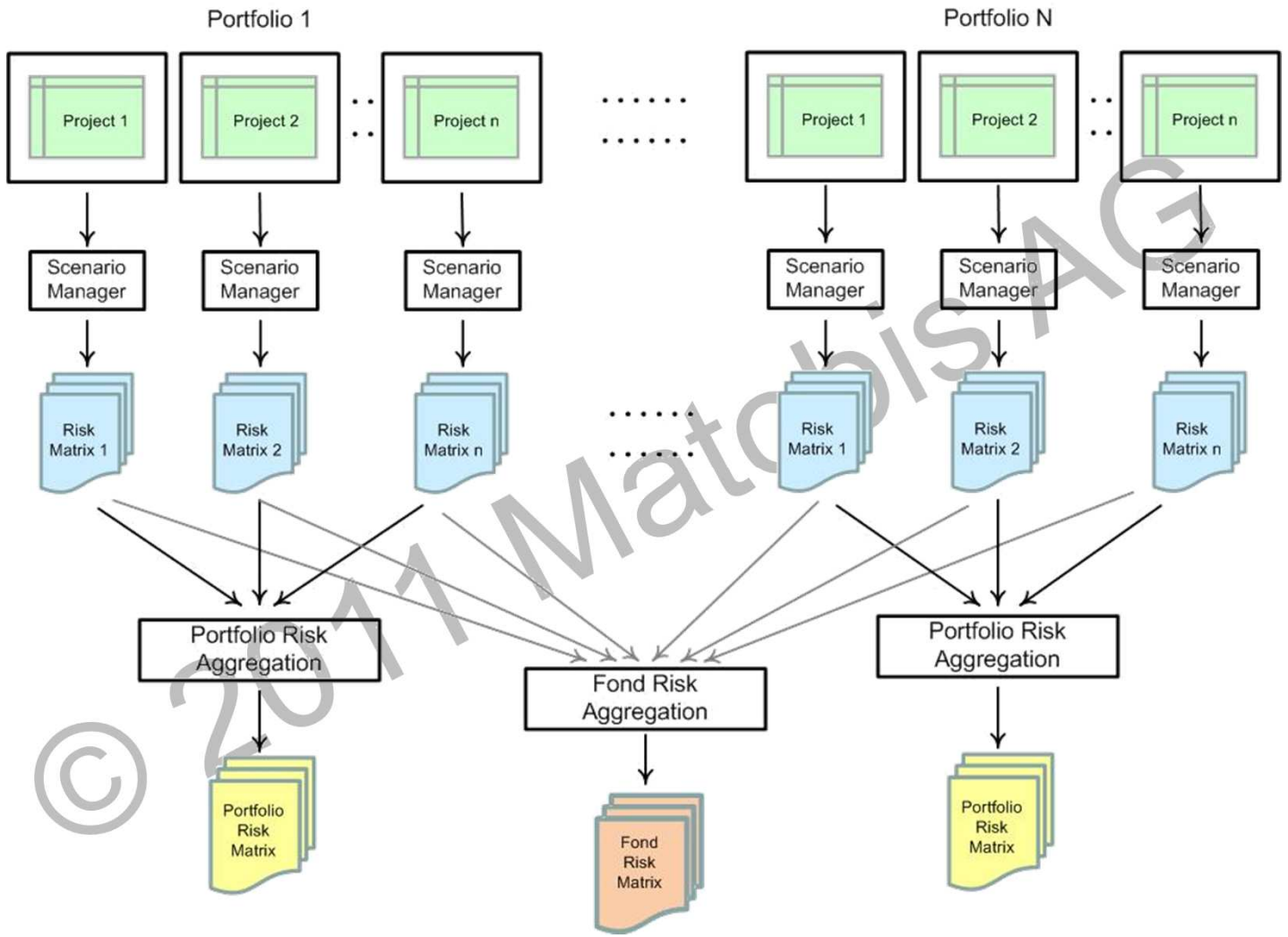
Risk aggregation

Aggregation of the risk matrices to the portfolio and fund level depending on the portfolio and fund structures

- Risk aggregation:
  - Horizontal integrated through common risk factors e.g. interest rate, Inflation, increase of operating costs, reduction of revenues, tax, etc.
  - Horizontal selective under special properties e.g. project type, technology, region, country, etc.
  - Under Best-Case, Expected-Case and Worst-Case assumptions
  - Under user-defined selections and aggregation rules

Risk aggregation



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Project-Manager and reporting

Analysis of single projects through the project manager, which has the following functionality:

- Project analysis
  - Cash flow calculation and aggregation
  - Risk analysis and liquidity plan
  - Project scenario manager
  - Risk matrix
- Project reporting
  - Project ratios: Debt/Equity, NAV, rate of return
  - Project liquidity
  - Investor-Overview-Report
  - Project Target-Performance-Comparison
  - Scenario-Reporting
  - Customized reporting

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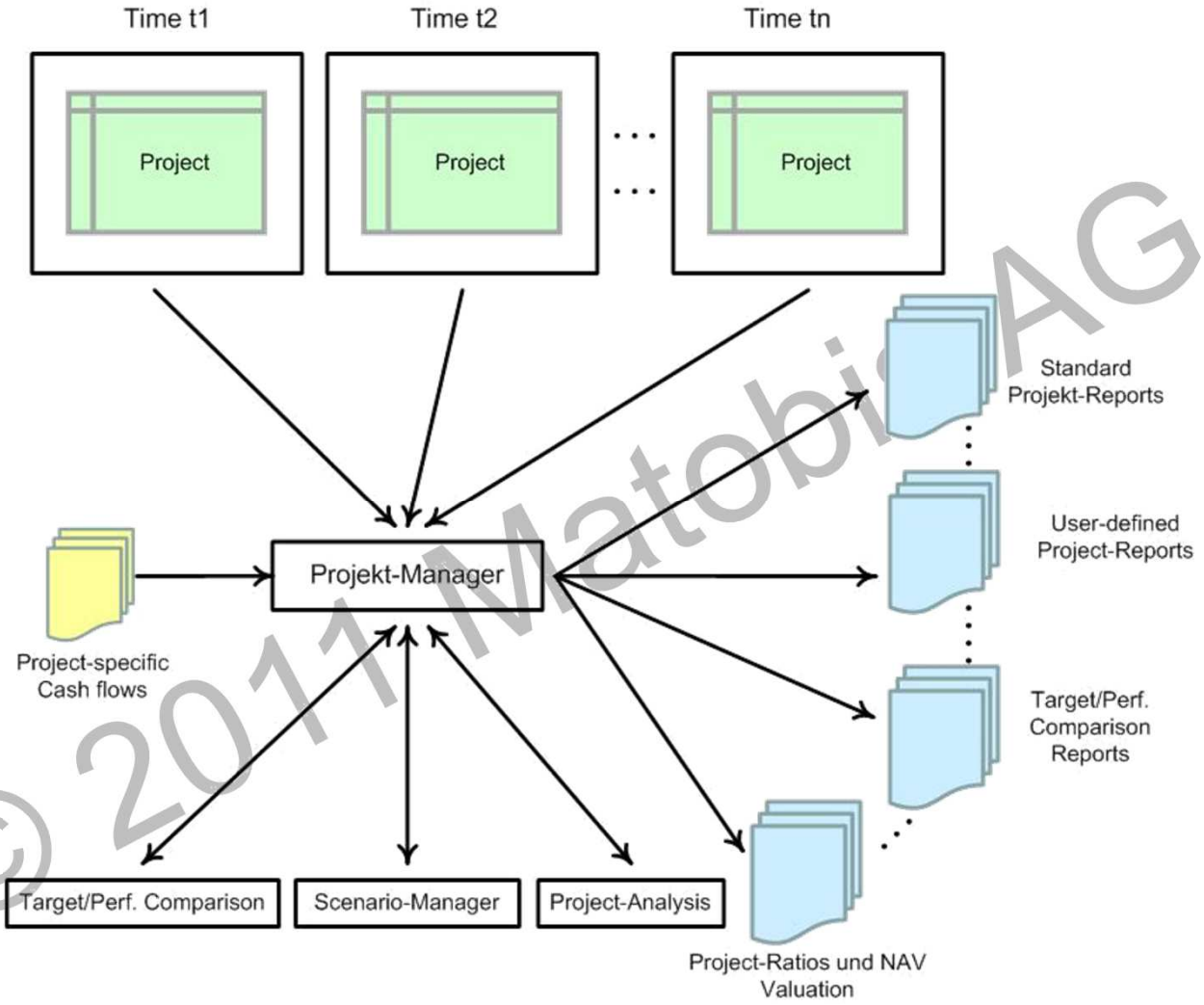
Project-Manager and reporting



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Portfolio-Manager and reporting

The analysis of project portfolios is provided by the module Portfolio-Manager. The key features of the Portfolio-Manager are:

- Construction of portfolios from single projects
  - Assignment of projects or project tranches to portfolios
  - Mapping of project cash flows on a joint time grid
  - Portfolio specific cash flows like management fees
- Portfolio analysis
  - Consolidation of project cash flows on the portfolio level
  - Calculation of key portfolio figures and the liquidity plan
- Portfolio Scenario-Manager
  - Aggregated risk matrix

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Portfolio-Manager and Reporting (cont.)

- Portfolio reporting
  - Portfolio components: equity/ debt, NAV, rate of return, technology, maturity, …
  - Liquidity plan on portfolio level
  - Investor overview report on portfolio level
  - Portfolio Planed/ realized evolution as function of time
  - Scenario reporting on portfolio level
  - Client specific reports on portfolio level

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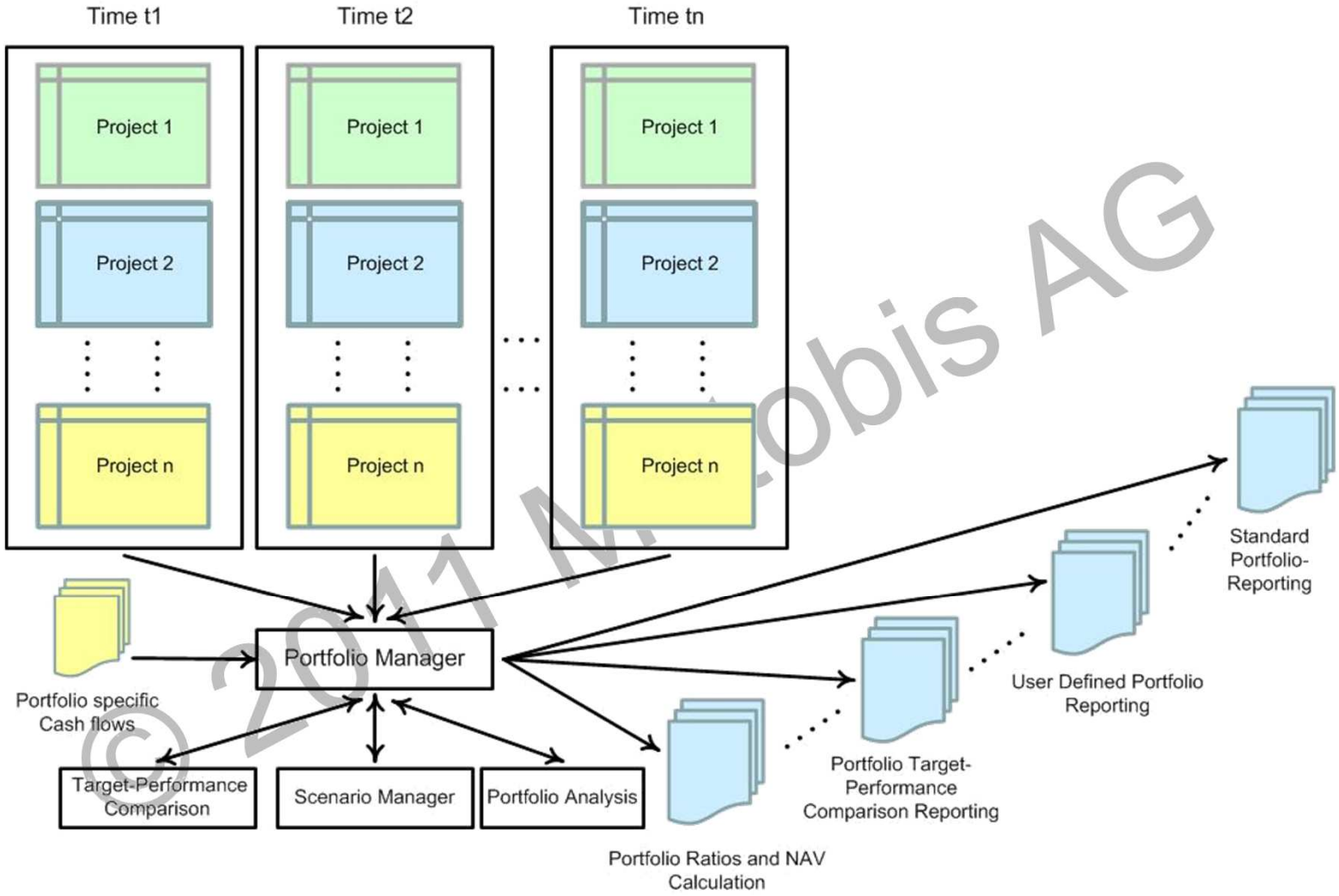
Portfolio-Manager and reporting



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Fond-Manager und Reporting

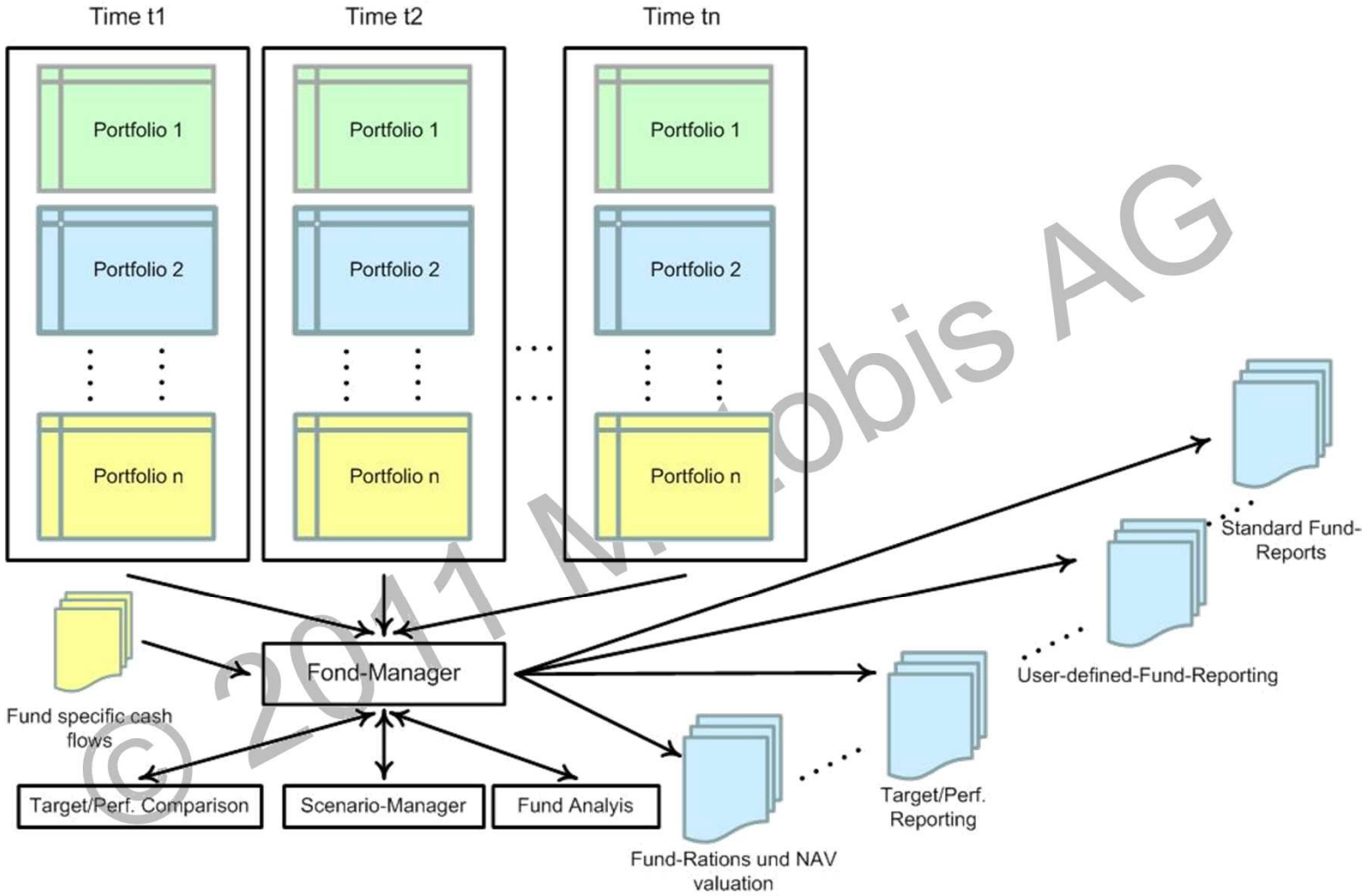
The analysis of portfolios on fund level is provided by the module Fond-Manager. The key features of the Fond-Manager are:

- Construction of a fund from portfolios
  - Assignment of portfolios and portfolio tranches to fund
  - Mapping of portfolios on a joint time grid
  - Fund specific cash flows like management fees
- Fund-Analysis
  - Consolidation of portfolio cash flows on fund level
  - Liquidity plan
  - Distribution of fund dividend
- Fund Scenario-Manager
  - Aggregated risk matrix

Fond-Manager and Reporting (cont.)

- Fund reporting
  - Fund components: equity/ debt, NAV, rate of return, technology, maturity, …
  - Liquidity plan on fund level
  - Investor overview report on fund level
  - Fund planed/ realized performance as function of time
  - Scenario reporting on fund level
  - Client specific reports on fund level

Fond-Manager and reporting



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