



## Maturus Optimi Consulting & Services

Maturus Optimi is an engineering consultancy that provides cost effective solution in the area of process engineering, energy efficiency, cost estimating & process economics. We work with research, engineering and business organizations, delivering best in class services to our clients across different industrial sectors: chemicals, petrochemicals, oil & gas, renewables and biotech, pharmaceutical and life science.

Our approach is straightforward and effective. We focus on understanding our client's needs and identifying opportunities for improvement and growth. The opportunities are presented in functional solutions, showing the value added to our clients businesses. Through all this we work closely with our customers' organizations, ensuring constant involvement of their key personnel and full alignment with company's objectives and standards.

Areas of Expertise:

- Process Engineering
- Energy Efficiency
- Cost Estimating and Process Economics

## Process Engineering

Our extensive knowledge and experience allows us to deal with any process engineering challenge in **Front End Design** (new processes and technologies) as well as in **Running Plants**.

With respect to **Front End Design**, Maturus Optimi specializes in converting new technologies and new process ideas into fully developed process concepts. This specifically includes: deriving model based mass and energy balances, drafting process alternatives, optimization, preliminary designs, etc. Furthermore, we identify steps and resources that are necessary to complete such tasks. This expertise is of great importance to organizations that need to evaluate innovative ideas and develop new businesses or products.

For **Running Plants**, Maturus Optimi offers solutions that support plant operation and manufacturing in improving their daily activities. Most commonly these solutions are focused on providing plant staff with **model based** advice on process operation and control. These so called decision making tools are exceptionally effective for improving plant efficiency up to 5% or more.

Besides daily operation support, we offer solutions that enable plant research and engineering teams to perform **strategic** improvement studies. The solutions are typically based on process simulation models that allow a variety of process analysis studies, including process optimization, "what if" studies,

Process engineering services	Process modeling and simulation capabilities
<ul style="list-style-type: none"> <li>• Integrated Process Development</li> <li>• Conceptual Design Studies</li> <li>• Detailed Mass and Energy Balance</li> <li>• Process Design Basis</li> <li>• Process Feasibility and Technology Evaluation</li> <li>• Process Alternatives Evaluation</li> <li>• Process Optimization, Troubleshooting and Improvement Studies</li> <li>• Process Control Design</li> <li>• Process Simulation and Modeling Services</li> </ul>	<ul style="list-style-type: none"> <li>• Steady state and dynamic models of industrial systems and processes</li> <li>• Modeling and simulation of new and existing plants</li> <li>• Process control systems modeling and simulation</li> <li>• Unit operation detailed modeling; equipment design, rating and simulation</li> <li>• Parameter estimation modeling</li> <li>• Interfacing with plant data</li> <li>• User friendly interface development for non-expert staff</li> </ul>

debottlenecking, capacity increase and new technology implementation studies.

## Energy Efficiency

Combining sophisticated modelling tools, various energy analysis methodologies and rich industrial experience, Maturus Optimi provides solutions that meet our clients' energy challenges. For **existing plant facilities** we focus on:

- Evaluating the current status of process energy efficiency
- Identifying energy savings opportunities
- Recommending energy effective designs and solutions

Depending on different factors such as the age, design and adaptability of a plant, our solutions bring from 3% to over 20% in energy efficiency increase. This ultimately results in: reducing the production costs, reducing carbon emissions and increasing the product value.

Considering **new processes**, Maturus Optimi helps their customers to focus on technology selection and design that is led by energy efficient solutions. Applying sophisticated software tools and methodologies we design process heat exchanger networks that give maximum energy recovery and efficiency. Additionally, we advise our clients on major energy equipment design, adjustment of process parameters and optimal utility selection leading to minimum energy consumption and costs.

Energy studies and optimization	Utility optimization
<ul style="list-style-type: none"> <li>• Process energy analysis and evaluation</li> <li>• Thermal targets &amp; energy performance analysis</li> <li>• Heat and process integration studies</li> <li>• Pinch analysis</li> <li>• Modeling and simulation of process energy networks</li> <li>• Identification of major energy saving opportunities</li> <li>• Energy Efficiency improvement studies</li> <li>• Process heat recovery maximization</li> <li>• Designing optimal process heat exchanger network</li> <li>• Reducing operating costs of the plant</li> <li>• Reduction of GHG emissions and CO<sub>2</sub> footprint</li> </ul>	<ul style="list-style-type: none"> <li>• Plant or plant site utility network analysis</li> <li>• Modeling and simulation of utility production site</li> <li>• Optimization of utility production plants</li> <li>• Efficiency improvement studies of utility production plants</li> <li>• What if studies: unit operation change, process parameter changes, capacity changes, energy contract changes, etc.</li> </ul>

## Cost Estimating and Economic Evaluation

Process improvements, development and implementation of new technologies are only interesting if they ultimately result in financially viable concepts. Maturus Optimi provides their customers with complete business cases, containing the economic data related to the project, from capital costs until operational costs. Evaluations are carried out for all scenarios whether new or existing plants, full or partial processes.

Our solutions include complete economic evaluation with recommendations and risks. In this way we can provide guidance to your R&D and speed up towards a successful project. Identifying your best options early is key to successful business operations.

Next to this Maturus Optimi also provides independent estimate reviews, fast and cost effective. Identify your main cost drivers but also hidden scope changes to make sure you are not confronted with surprises afterwards. Over the years we have performed numerous reviews in a wide spectrum of industrial sectors mentioned earlier.

### Cost estimating and process economics services

- Provide cost estimating services as an external and independent consultant
- Develop Cost Estimates for: Pre-Feasibility, Feasibility and Conceptual project stages
- Process Alternatives and Relative Costing
- Economics of Greenfield, Revamps and Turnaround Projects
- Independent Review Estimates (from Contractors) all types -including Basic and Detailed estimates
- Project Scope Development and Reviews
- Estimate Relocation - location factor method for simultaneous multi-location analysis
- Risk Assessment for Scope and Economics with Monte Carlo based analysis
- Creating Economic Models for Licensed Processes
- Full Financial Analysis of the project
- Temporary provide you with a flexible workforce

To find out more about Maturus Optimi services please visit our website:

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