

Aspen Economic Evaluation Family

A family of products that estimates project capital costs and lifecycle asset economics—from conceptual definition through detailed engineering

The *Aspen Economic Evaluation* product family enables companies to rapidly and confidently evaluate capital investment projects early in the design process, to understand the economic implications of engineering decisions, and to effectively manage the project.

- Reduce capital costs by 10-30%
- Reduce plant operating costs by 2-5%
- Improve engineering efficiency by up to 30%
- Make more informed capital decisions

Economic Evaluation for Process Engineers: **page 3**

Aspen Process Economic Analyzer—Project scoping tool that enables front-end consideration of lifecycle costs.

Economic Evaluation for Cost Estimators: **page 4**

Aspen Capital Cost Estimator—Generates both conceptual and detailed estimates using a highly scalable and comprehensive solution.

Economic Evaluation for Plant Operators: **page 5**

Aspen In-Plant Cost Estimator—Economic project management tool for in-plant capital and maintenance projects.

||||||| The Challenge: Make Capital Decisions Faster—with Fewer Uncertainties

Today's global competition in the energy and process industries puts increasing pressure on time-to-market and the profitability of product lines. As a result, companies require more accurate and detailed cost projections for proposed initiatives. Fast-track schedules demand quicker, more informed decisions earlier in the design process, when engineers and business managers least understand project costs. To balance operating margins, return on capital, and technology choices, project teams must reach decisions faster and with greater confidence—without adding personnel—while sharing assumptions and findings transparently throughout the enterprise.

||||||| The AspenTech® Solution: Maximize Project Profitability

The *Aspen Economic Evaluation* product family combines the industry's most comprehensive costing with rigorous engineering and construction models to generate highly accurate cost estimates. Companies deploying these solutions are able to reduce capital and operating costs, increase engineering efficiency and quality, and accelerate time-to-market with faster payback.

Aspen Economic Evaluation Family

||||||| Integrated Solution Delivers Proven Results

The *Aspen Economic Evaluation* product family integrates rigorous process models with the industry's most comprehensive and detailed economic evaluation capabilities. Key business-enhancing benefits include:

- **Rapid screening of engineering alternatives.** Through automatic generation of economic details, the software automatically defines project scope and costs from conceptual design information, adding supporting details as the project evolves.
- **Reduced project costs.** Estimates are based on precise, up-to-date, and geographically specific data on labor, materials, fabrication time, wiring, piping details, and other plant construction cost information.
- **Faster, more confident decisions.** The solution set clarifies the economic impact of every engineering decision, enabling project teams to see how changing economic assumptions or execution strategies will alter project economics.
- **Improved execution.** Detailed cost estimates enable owner-operators, EPCs, and licensors to negotiate based on scope-related facts and hard data, leading to smoother project executions.

||||||| Reaching Optimal Decisions Faster

Economic evaluation is driven by engineering decisions. These include choices about technology, capacity, configuration, location, and project timing. Alter any one of these and it will impact plant economics.

Effective economic evaluation tools must automatically recalculate costs based on conceptual engineering changes. Equally important, they must automatically fill in the details that these changes imply—from plant bulks and piping to utilities and control systems.

Some tools do this with multipliers, but this is imprecise. The more accurate approach used by AspenTech is to generate estimates from plant construction data and models that incorporate infrastructure costs. Calculating costs from the bottom up yields highly accurate estimates. It also provides detailed information that engineers can use to identify major cost centers and the true barriers to project success.

Finally, model-generated estimates grow more detailed and precise as project engineering advances. The costs are based on data specific to the project as the information is developed. This helps to ensure that managers base all project decisions on consistent economic and engineering assumptions while streamlining the transparent sharing of information among enterprise and business partners.

Fluor relies on *Aspen Capital Cost Estimator* to achieve real-time collaborative estimating for projects—improving agility and peak-loading, while eliminating uncertainties. This gives their clients faster and better results.

||||||| Aspen Icarus™ Technology

The *Aspen Economic Evaluation* product family is based on Aspen Icarus technology, the process industry standard for process and project evaluation. Unlike other approaches, the technology does not rely on capacity-factored curves for equipment pricing, nor does it rely on factors to estimate installation quantities and installed cost from bare equipment. It follows a unique approach where equipment, with associated plant bulks, is represented by comprehensive design-based installation models. Project teams are able to reach faster, more accurate decisions based on consistent technical and economic information.

Aspen Process Economic Analyzer

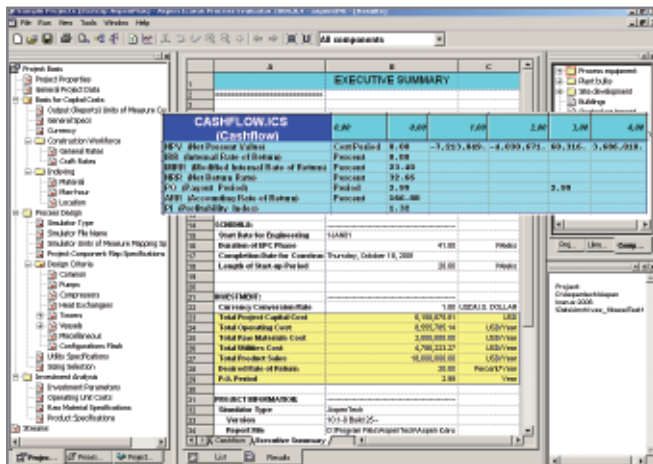
Product Overview

Aspen Process Economic Analyzer projects the cash flow and operating cost of competing technologies and process configurations during conceptual design, automatically populating engineering models with details needed for economic evaluation. Proprietary mapping technology expands initial unit operations into actual equipment models and preliminary sizes and then calculates costs using design-based installation models. Powerful sensitivity capabilities depict how variations in feedstock and utility costs, product pricing, project timelines, process changes, and other assumptions affect profitability.

Automatic Generation of Engineering and Economic Details

The rule-based system within the product family allows companies to evaluate process design alternatives quickly, early, accurately, and consistently. Used primarily by process engineers during the early conceptual design phase, *Aspen Process Economic Analyzer* enables companies to significantly improve engineering productivity and reduce cycle time through automated scope development. Other benefits include:

- Fully understand the economic impact of design decisions so as to focus on high-return projects
- Use analysis data to further improve project profitability
- Quickly provide management with solid answers for confident capital decisions



Aspen Process Economic Analyzer provides a detailed view of projected investments, enabling users to align design concepts with capital and operating costs and quickly provide management with reliable answers, leading to better-informed capital decisions.

Enabling Process Engineers to Improve Front-End Feasibility Assessments

Function

- Interactive equipment sizing to determine operating costs and investment analysis
- Automatic generation of block and process flow diagrams from the process stream information
- Enables integrated economics with Aspen Plus® and Aspen HYSYS®
- Export to Aspen Capital Cost Estimator to provide detailed cost adjustments, etc.

Benefit

- Develop highly accurate estimates from conceptual process definitions
- Evaluate lifecycle business impact of design alternatives in the early phases of conceptual design
- Expand unit operations into actual equipment models and calculate preliminary sizes
- Seamless workflow from process design to basic engineering

Aspen Capital Cost Estimator

Product Overview

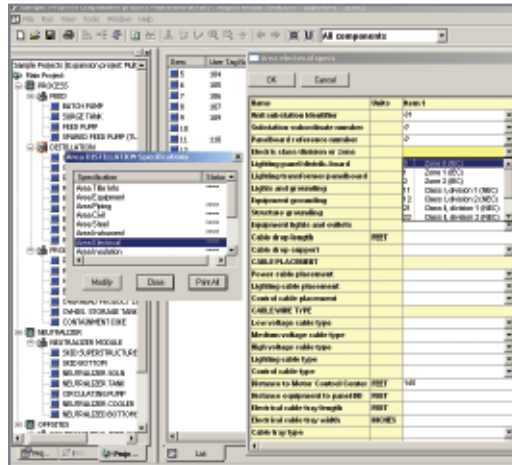
Aspen Capital Cost Estimator supports the generation of conceptual and detailed cost estimates and schedules over the project lifecycle. It creates accurate budgets from conceptual definitions, and offers powerful tools to optimize control, power, and piping as well as supports project relocation and scaling based on plant size. Its ability to define contract structures for multiple EPCs and vendors helps project leaders analyze execution strategies, manage change orders, and control costs.

Accurate and Reliable Costing Results

Aspen Capital Cost Estimator analyzes investment options during conceptual engineering. Costs automatically update as engineering specifications change, providing clear visibility of how changing assumptions affect project economics. Additional benefits include:

- Maximize your company's return on investment (ROI) and reduce the risk involved in making decisions
- Obtain detailed EPC estimate from minimal input in a fraction of the time required by traditional methods
- Reduce estimation variability by adopting a consistent methodology

Suncor streamlined cost estimating and execution on a major project involving 20 subcontractors and 458 design modules—demonstrating the accuracy, flexibility, and scalability of *Aspen Capital Cost Estimator*.



Aspen Capital Cost Estimator allows you to add area specifications, further refining the scope.

Delivering the Easy-to-Use Tools and Data for Cost Estimators

Function

- Supports cost estimation from preliminary design adding detail throughout the estimation and bid process and provides integration with detailed design systems
- Scales to support multi-billion dollar mega projects
- Fully supports formal cost estimation methodologies such as handling multiple contractors, power distribution and control systems integration
- Supports five regional locations: US, Europe, Middle East, Japan, and U.K.

Benefit

- Develop detailed designs, estimates, and schedules from minimal project outlines
- Model and analyze project execution strategies and control project costs with trending estimates
- Easily customize a country or project standard basis to more accurately model the specific costs for a company
- Incorporate piping design to increase estimating accuracy

Aspen In-Plant Cost Estimator

Product Overview

Aspen In-Plant Cost Estimator is a powerful economic project management tool for in-plant capital and maintenance projects. The challenge in project management is to satisfy the three constraints of quality, time, and cost. Using traditional project management tools, typically only two of the three can be optimized. By integrating the project economic capabilities of the *Aspen Icarus* technology with the industry-leading project management capabilities of Primavera Scheduling, *Aspen In-Plant Cost Estimator* enables companies to optimize all three constraints simultaneously.

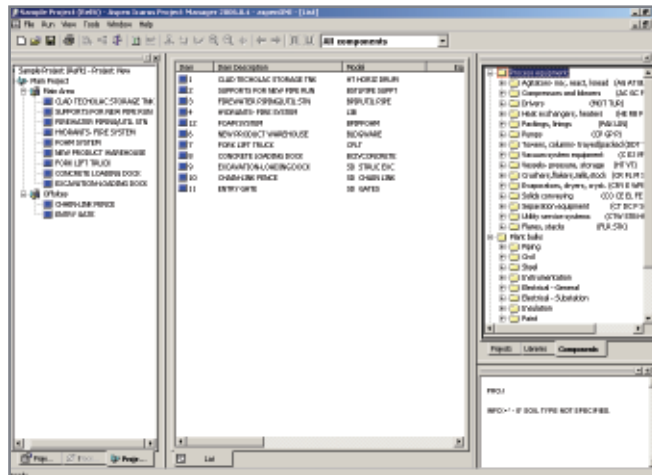
Enhanced Project Management and Execution

Used during revamps and evaluation of debottlenecking projects, *Aspen In-Plant Cost Estimator* enables companies to create project schedules and detailed budgets. Users are able to define and manage contracts with third parties, ensuring that projected improvements in plant profitability are realized.

Aspen In-Plant Cost Estimator is well suited for in-plant turnarounds and retrofits which require:

- Customized scoping
- Schedule-driven project management
- Smaller in-plant projects
- What-if scenarios
- Risk analysis for labor force

Aspen In-Plant Cost Estimator automatically generates infrastructure requirements from minimal project outlines.



Empowering Plant Operators to More Effectively Address Challenges

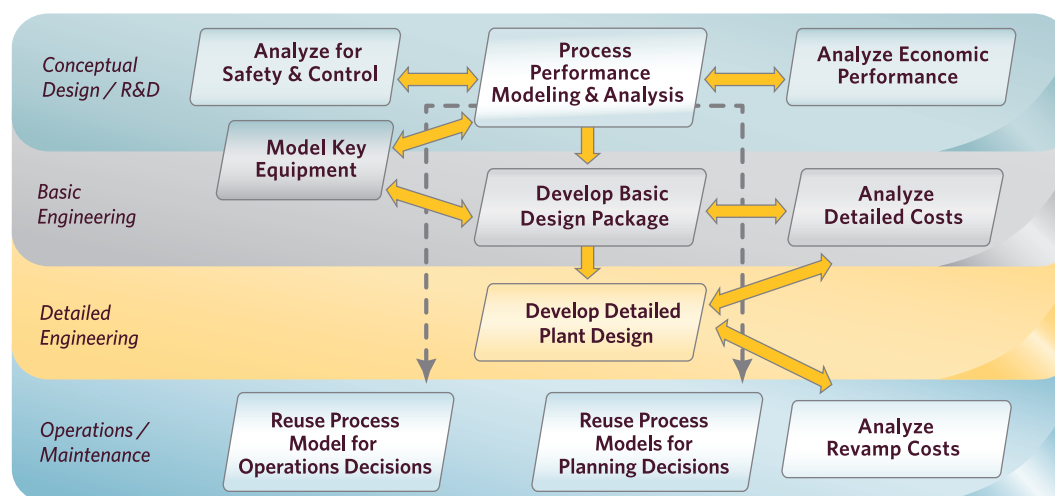
Function

- Analyze detailed costs
- Engineering designs of equipment and bulks
- Integration with Primavera Scheduling to generate a logic-driven CPM construction schedule (complete with activities, durations, manpower, and costs)
- Integration with Cost Data Analysis (formerly Richardsons)

Benefit

- Develop accurate estimates from scope definition
- Checks scope for validity
- Optimization of quality, time, and cost for a project

The Scope of aspenONE® Engineering



||| ||| ||| aspenONE® Engineering

The *Aspen Economic Evaluation* product family is a key component of *aspenONE Engineering* for the process industries. *aspenONE Engineering* is an integrated lifecycle solution—from conceptual design to plant start-up and operations support—enabling you to model, build, and operate safer, competitive, and more reliable process plants. Companies are able to reduce capital and operating costs, increase engineering efficiency and quality, and accelerate time-to-market with payback in months instead of years.

||| ||| ||| About AspenTech

AspenTech is a leading supplier of software that optimizes process manufacturing—for energy, chemicals, pharmaceuticals, engineering and construction, and other industries that manufacture and produce products from a chemical process. With integrated aspenONE® solutions, process manufacturers can implement best practices for optimizing their engineering, manufacturing, and supply chain operations. As a result, AspenTech customers are better able to increase capacity, improve margins, reduce costs, and become more energy efficient. To see how the world's leading process manufacturers rely on AspenTech to achieve their operational excellence goals, visit www.aspentech.com.



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